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The Atlantic Monthly

MARCH 1998

E.O. WILSON BACK FROM CHAOS

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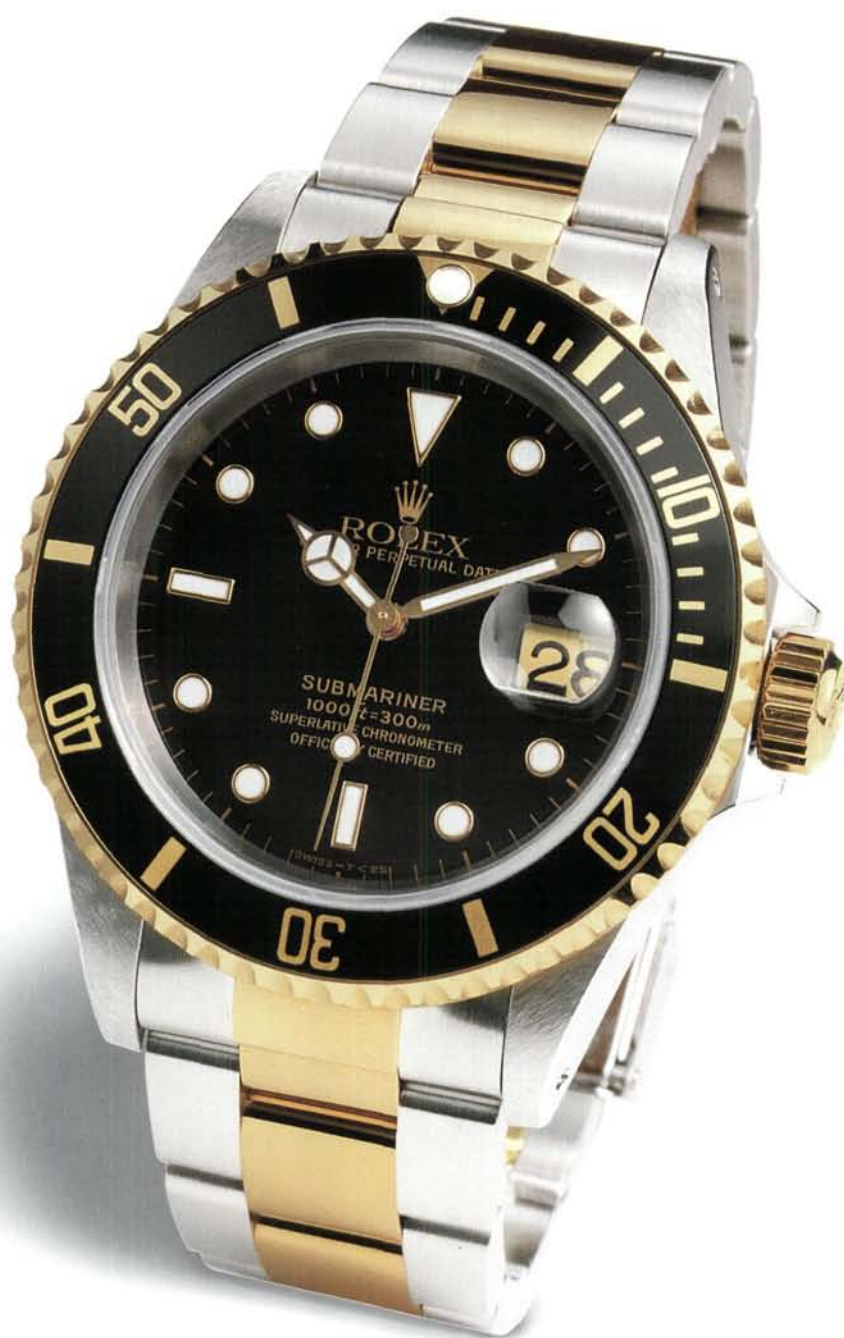


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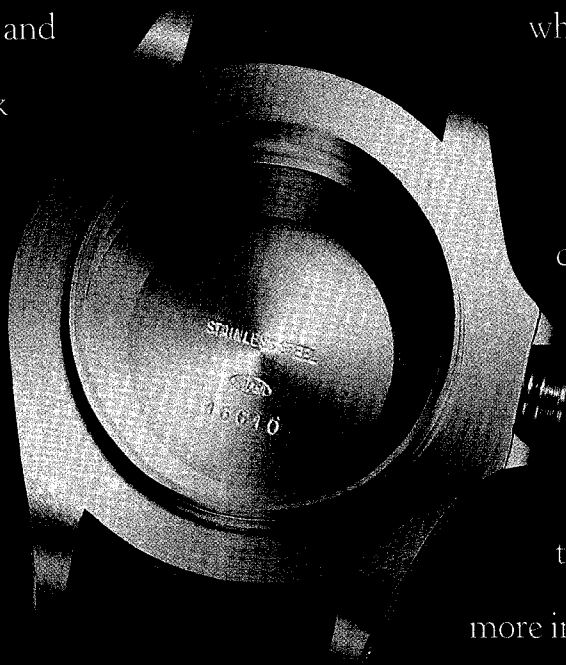
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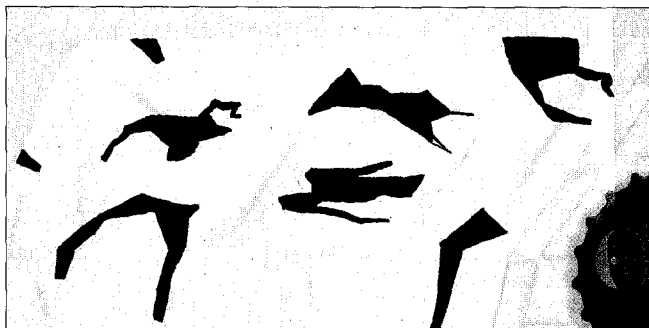
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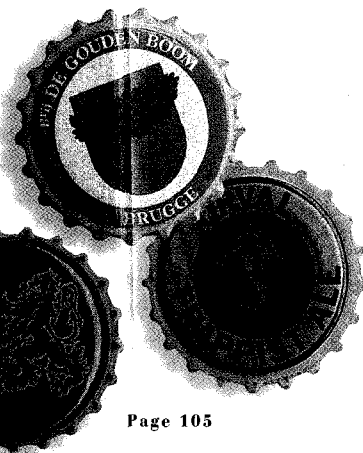
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77 NORTH WASHINGTON STREET

EDWARD O. WILSON, the author of this month's cover story ("Back From Chaos"), describes himself as "a congenital synthesizer." That explains a lot—including why Wilson, who is generally considered to be the world's leading authority on ants, is writing in these pages about intellectual history and the need to fuse the sciences and the humanities. Wilson himself embodies that fusion: he is one of this century's most influential scientists, a hands-on practitioner who believes that "biology is the key to human nature"; he is also a distinguished writer who models himself after the "very few" great science writers, like Darwin and Freud, "who can trouble and move the deeper reaches of the mind."

Based for the past four decades at Harvard University, Wilson most famously committed the act of synthesis in his book *Sociobiology* (1975), a text that proposed "the systematic study of the biological basis of all social behavior" and, in its final chapter, asked readers to "consider man in the free spirit of natural history, as though we were zoologists from another planet." Wilson suggested that an understanding of the social behavior of animals was necessary in studying the social behavior of human beings; he also pro-

posed that genes play a role in determining human nature. This prompted some alarmingly emotional reactions (Wilson was accused of offering scientific legitimacy to racists, sexists, and even Nazis), the most memorable of which came at the 1978 meeting of the American Association for the Advancement

of Science, when an irate heckler approached Wilson, a guest speaker, and dumped a pitcher of ice water on his head.

That same year Wilson published *On Human Nature*, in which he marshaled in his defense the combined forces of, among others, Sappho, primitive wasps, David Hume, the ammonia molecule, W. B. Yeats, and troops of chimpanzees. Two decades later much of the resistance to sociobiology has fizzled, and Wilson has gone on to research and write voluminously about ants, population biology, ecology, and human nature, in the process racking up dozens of scientific and literary awards.

Wilson is unapologetic in his belief that a conceptual unity underlies all branches of knowledge, that the close empirical study of the natural world can help us to understand this unity, and that such understanding will, quite simply, improve life. All life, that is, not just the human variety. —THE EDITORS



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Peter Schrag ("California, Here We Come") writes frequently on education and politics. His article in this issue will appear in somewhat different form in his book *Paradise Lost: California's Experience, America's Future*, to be published next month by The New Press.

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Edward O. Wilson ("Back From Chaos") is the Research Professor and Honorary Curator in Entomology at Harvard University. Two of his books have been awarded the Pulitzer Prize in the general nonfiction category: *On Human Nature* (1978) and *The Ants* (1990). Wilson's article in this issue is taken from his book *Consilience: The Unity of Knowledge*, which is to be published next month by Knopf.



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LETTERS

The Computer and the Economy

I appreciate that Alan S. Blinder and Richard E. Quandt ("The Computer and the Economy," December *Atlantic*) are not trying to uncover all the ways in which government productivity figures miss or misrepresent actual productivity. Nonetheless, one characteristic of such statistics is that they will always overstate productivity gains, and will do so increasingly as more of the gross domestic product is produced through electronic means.

Product and productivity are typically overstated because they are confined to monetized accounting within businesses. Surely it is well understood by now that businesses externalize costs not by accident but by strategy. Send waste into public water or public air, get the government to build the transportation infrastructure required to move employees from home to work, and so forth. The real net product (value added) is the company's apparent product less all real costs, but to the extent that the company succeeds in passing such costs on to others, its net product appears artificially large.

Two examples of work being performed outside the company—and thus of "productivity" appearing larger than it is because of the failure to measure all the work done in producing a product—are self-service gasoline stations and boxed, build-it-at-home furniture. It is not an argument against either of these innovations, both of which I admire, to point out that some of the production has been passed out of the firm, to the customer. As long as the customer is not another business, his work is not recorded. Productivity (the output per unit of input) is exaggerated by undercounting the inputs.

The automated teller machine is another example. Customers now do the key entry formerly done by bank employees. It always pays the firm to exter-

nalize its costs, even if it does so to another firm. So now parcel-delivery companies have convinced shippers that it is to their advantage to track parcels by computer, thus sending the labor cost of that tracking from the delivery company to the shipping company. The productivity gain to the delivery company may not have shown up in the data yet, because of the cost of establishing the system. There may ultimately be some overall productivity gain (why have two employees involved, one of them waiting on the telephone, when one can do it?), but it will not be as large as the calculation correctly made by the delivery company concerning *its* productivity. Firms computerize, despite little sign of productivity increases in overall statistics, because they are driven by different data, internal data, showing that *their* productivity is increased.

These are small examples, but as we spend more time online transferring funds from savings to checking accounts, buying financial or tangible goods, or just being entertained, two statistical phenomena are occurring: consumer time is uncounted, thus making overall productivity appear greater than it is; and time is being taken by employees of customer companies that was formerly taken by employees of producing companies. Thus individual firms get to make decisions that are not as good as their accounting suggests, because they pass costs on to others; and some of these others, not counted as producers, are lost to productivity statistics. Blinder and Quandt's statement that "labor input is measured accurately" misses the impact of computerization, which is often to pass labor input out of the firm. In the future there will be fewer bookkeepers and fewer data-entry clerks, as data entry becomes the customer's task.

Stephan Michelson

*LongBranch Research Associates
Takoma Park, Md.*

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EXACTLY BRAIN SURGERY.
(IF ONLY IT WERE THAT EASY.)

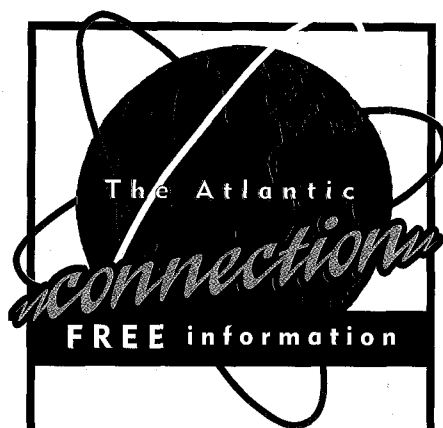
About the only aspect of the health care debate any two people might agree on is that the system needs work. We'd like to weigh in with a few ideas of our own since we're actually in the position to do something

about it. ■ First off, the paramount focus of health care must be quality. Which is why we're working to enable a level of health care never available under the old fee-for-service system. ■ We can't do it alone. So we're joining with academic medicine to make the system better. We've pioneered and allocated \$15 million to fund the Academic Medicine and Managed Care Forum. An ongoing gathering of our experts, and those from more than 30 leading universities and teaching hospitals. Including Johns Hopkins, Yale, Emory,

Baylor, University of Pennsylvania and Stanford. Together, we're seeking new ways to help get patients the health care they need. ■ Already, we send timely reminders that encourage members to see their doctors for immunizations to prevent illness and screenings that diagnose disease early enough to do something about it. One result has been a significant reduction in late-stage breast cancer. ■ To better manage chronic diseases, we've created outreach efforts that have reduced asthma emergencies 60%, promoted eyesight-saving laser therapy for diabetics, and improved the quality of life for people with congestive heart failure. ■ There's more work to be done. And we'll do more than our share of it. Because no matter how complex, it has never been our policy to turn our back on a problem. Whether it's that of a patient, or of an entire health care system.



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Classical Appeal

I read with interest David Schiff's article "Classical Appeal" (August *Atlantic*) and the letters and author's response in the December issue. As someone whose musical taste was defined by rock-and-roll (and who would presumably therefore be part of the vast untapped audience that orchestras wish to attract), I have to say I think that orchestra programmers are way off base when they assume that the way to draw more devoted listeners is to offer pops programs or to trot out again the same handful of "proven" crowd pleasers. Instead, they could seek out fans of other musical genres who have, as one writer put it, "the same aesthetic expectations as the concert audience."

With few exceptions, the most satisfying concert experiences for me have been performances of twentieth-century works: Bartók, Lutoslawski, Martinu, Paulus, Shostakovich, Varese—music that to me is close in spirit to iconoclastic, uncompromising rock-and-roll along the lines of, say, Sonic Youth or Husker Du, or maybe jazz by Thelonious Monk; music that demands and rewards a fair amount of effort on the part of the listener. Maybe this is a more promising "cross-over" path: from challenging music to challenging music. Get them hooked on Hindemith and eventually they'll learn to appreciate Brahms and Mozart.

Gregory M. Donley
Cleveland Heights, Ohio

My old friend Henry Martin makes a cogent response in your December Letters column to David Schiff's dismay over orchestras' selling their classical souls to the popular devil. Martin somewhat overstates his case, however, in three ways.

1. Even granted that the masterpieces of Western concert music have been overperformed and overrecorded, it does not follow that "there is no point" in continuing to play them. After all, they are masterpieces, which suggests an inexhaustibility of sorts, even if they can be trivialized in the hands of a mediocre interpreter. Modern theaters still perform Shakespeare, Molière, and Sophocles. Why is it so unthinkable that orchestras would do the same—play the older musical monuments with attention, insight, and passion, within a context that in-

cludes many more-recent masterpieces?

2. I'm not sure the stylistic divide is as simple as the one Martin presents—namely, that the public rejected contemporary music exactly when that music embraced atonality. After all, Schoenberg's 5 Orchestra Pieces (Op. 16), Berg's 3 Orchestra Pieces (Op. 6), Bartók's *Miraculous Mandarin*, and Stravinsky's *Le Sacre du printemps* all tend to be received well in concerts by orchestras that can afford to play them. (One could, of course, make a strong case that several of these pieces are not really atonal—which underscores the problem of using that term as an absolute criterion, since few will agree on which piece it applies to.) Surely the blame can be more persuasively ascribed to arrogance—to some recent composers' indifference to the preferences and opinions of their audiences, a direct descendant of the nineteenth-century Romantic delusion of the superior but unappreciated artist.

3. Martin (a distinguished scholar of jazz) naturally identifies popular non-electric styles as providing a way of revitalizing the orchestral concert repertoire. I would simply reply that they're not the only way. The language of tonality is far from used up, even within non-popular idioms. Pieces such as Rachmaninoff's *Symphonic Dances*, Prokofiev's *Romeo and Juliet*, and Britten's *Variations on a Theme of Frank Bridge* (all written within a few years of 1940) display unique and sophisticated tonal languages that are all pregnant with developmental possibilities. Unfortunately, in training young composers we don't often show them the fruitfulness of this music, because we have such a poor grasp of twentieth-century tonal harmony—and lots of remarkable music is dismissed as "conservative," "sentimental," or "recidivist," to the detriment of composers, audience, and orchestras alike.

Charles J. Smith
*Associate Professor of Music Theory
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Advice & Consent

In their reply to my essay "Do We Consume Too Much?" Paul Ehrlich and his co-authors ("No Middle Way on the Environment," December *Atlantic*) cite the

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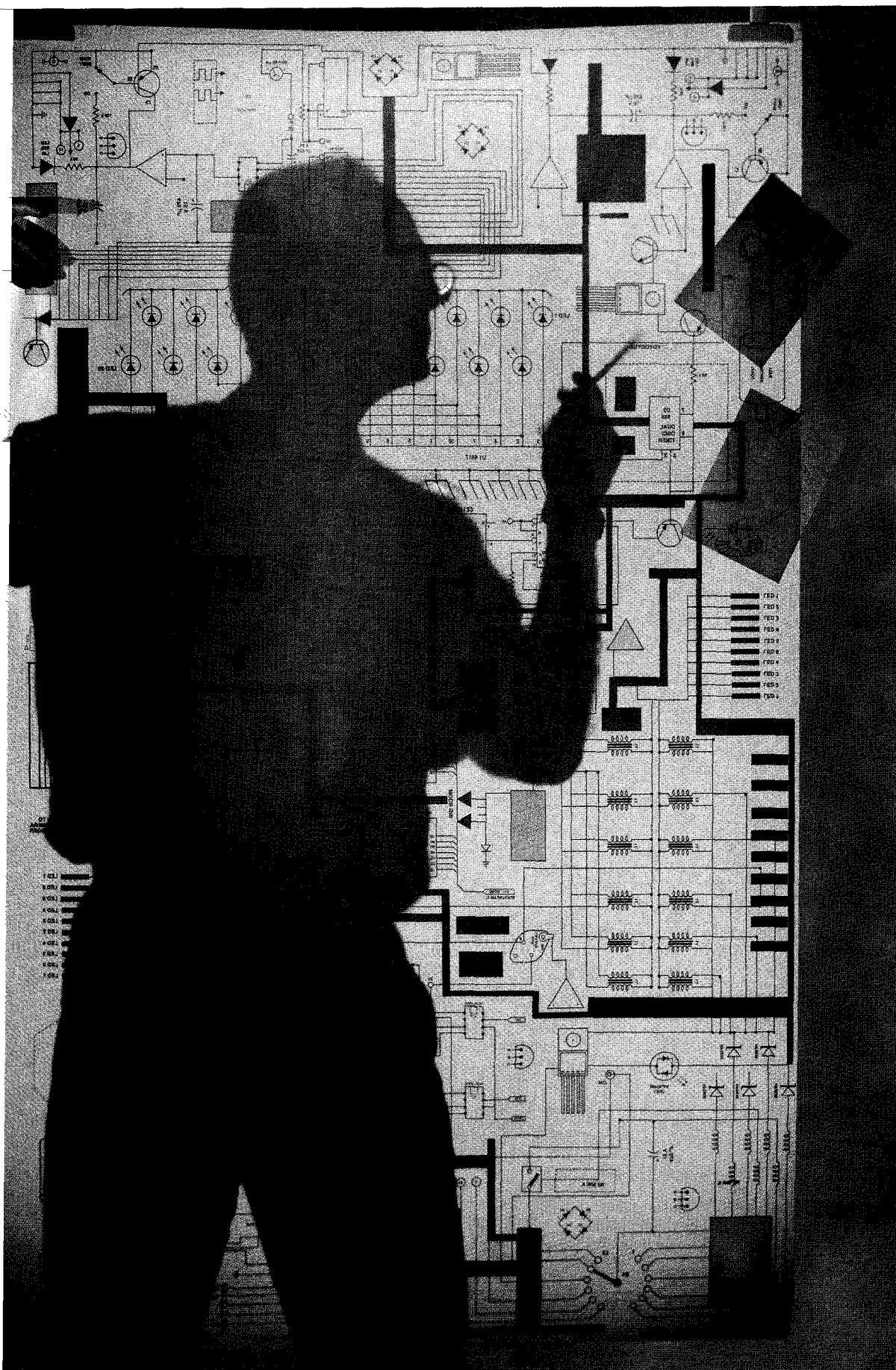
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economist James Meade's assessment that "pollution and the exhaustion of natural resources depend and will depend in the future on the absolute level of total economic activity" in the world. The principle that economic growth or prosperity must lead to resource depletion and ecological degradation, an article of faith for Ehrlich, is simply false. The evidence overwhelmingly shows that people in poor societies who hunt and gather for resources can denude the landscape, while wealthy nations can deploy technologies that produce food sustainably, control pollution, and preserve nature. The "World Scientists' Warning to Humanity," which my critics invoke, does not say that the world must produce and consume less overall, only that it must produce and consume *differently*. It declares, "We must, for example, move away from fossil fuels to more benign, inexhaustible energy sources to cut greenhouse gas emissions and the pollution of our air and water."

I did not argue, as my critics charge, that "concern over the depletion of natural resources and the impact of their current levels of use is misplaced." Rather, like the "World Scientists," I proposed that society should respond to this concern by adopting technologies now available or plainly in view that can sustain greater global economic activity without imperiling natural systems or depleting natural resources.

Ehrlich and his colleagues argue that a series of misconceptions underlies my thesis. First, they say, I fail to understand that since natural resources are finite, the expansion of the global economy must inevitably lead to depletion and scarcity. In their view, pollution and depletion vary directly with the absolute level of global economic activity. In other writings Ehrlich expresses this assumption in a formula that measures adverse environmental impact as a function of population, affluence, and technology. Because technology appears in the numerator of Ehrlich's equation, it can only increase the bad impacts of population and affluence. Yet smart and environment-friendly technology should appear in the denominator, since it *diminishes* these impacts. If the world adopts cleaner and smarter technologies (for example, more-efficient cars), it does not have to use more resources to produce more of the things people want. The enormous gains

in economic activity associated with the software industry, to take another example, did not create a lot of pollution or exhaust resources.

My second "misconception" is to believe that aesthetic and moral arguments, such as those associated with the preservationist John Muir, provide the most persuasive reasons for protecting old-growth forests, wetlands, and endangered species. Of course, no one believes that we conserve raw materials, such as copper ore, for aesthetic reasons. I argued that many of nature's most beautiful and expressive objects—an ancient stand of redwoods, for instance, or a rare and magnificent species of bird—possess far greater intrinsic value than economic or instrumental value. We are more likely to protect these objects if we value them for their own sake rather than for the ways we use them.

Ehrlich and colleagues, while acknowledging aesthetic, religious, and moral concerns, believe that I misconceive how nature works. Referring to Biosphere 2—a failed attempt to replicate natural cycles artificially—these scientists point out how much better-designed are the "conditions and processes through which natural ecosystems, and the species that are a part of them, sustain and fulfill human life." Apparently my critics would rule out virtually everything human beings have done to feed, clothe, and shelter themselves—not just farming but even hunting and gathering—since any change may alter nature's delicate and unknown "conditions and processes" and therefore may rend its "intricate and little-explored" design. Ehrlich and colleagues analogize the extinction of a rare gopher, butterfly, or lousewort, no matter how little it affects surroundings, to "popping the rivets out of the airplane your children must fly in." They caution, "Until science can say *which* species are essential in the long term, we exterminate *any* at our peril." We need more than vague references to nature's equilibrating and beneficent design, however, to argue against particular proposals that make apparent economic sense—for example, to convert the habitat of an endangered beetle or badger to a university, day-care center, or hospital.

Third, Ehrlich and his co-authors call to my attention political and social obstacles to a quick transition to efficient technologies and renewable resources. But like my

critics, I deplored what my essay calls "lemon socialism." "A vast array of subsidies and barriers to trade," I wrote, "protects politically favored technologies, however inefficient, dangerous, filthy, or obsolete." I also quoted the environmental consultant Michael Brower: "At heart, the major obstacles standing in the way are not technical in nature, but concern the laws, regulations, incentives, public attitudes, and other factors that make up the energy market." Rather than overlooking such factors, my essay tried to show that it is precisely these obstacles—and not the purported existence of absolute limits to the earth's "carrying capacity"—that ought to be the focus of environmental policy.

Fourth, to refute my "misconception" that the North doesn't exploit the resources of the South, Ehrlich and colleagues note that "the rich-poor gap" is increasing. I wrote, "What is worsening is the discrepancy in income between the wealthy and the poor." The income gap between Silicon Valley billionaires and starving Hutu warriors, however, did not arise because one group exploited the natural resources of the other. I intended to refute the persistent idea that the world works on the colonial system in which rich countries import raw materials from poor ones and ship back finished goods. Today rich nations exclude and displace from world trade the commodities that poor countries offer for sale.

How does Ehrlich propose to rectify the "rich-poor" gap? He rules out "the hope that development can greatly increase the size of the economic pie and pull many more people out of poverty." This "basically . . . humane idea," he has written, is "made insane by the constraints nature places on human activity." If the global economy has reached its limit—if nature shuts the door on economic growth—then any gain the poor make must come at the expense of the rich. In this zero-sum game we must lop off the peaks to fill in the valleys. It may be a hard political sell to get the rich countries to adopt the policy I favor, which is to transfer to poor countries efficient and nonpolluting technologies. It would be an even harder sell, however, to get the rich nations to divide their wealth equally with poorer ones.

Mark Sagoff

University of Maryland
College Park, Md.



Wear sweats.

Someday I plan to: Go to film school. Shop flea markets in Paris.
Get my piano tuned. Finish a marathon (in under six hours).

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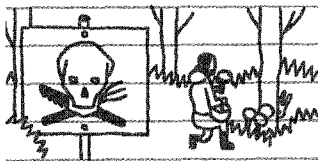


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THE MARCH ALMANAC

Government

March 1: By today, according to the Violent Offender Incarceration and Truth-in-Sentencing Incentive Grant Program, all participating states must submit to the federal Corrections Program Office plans for testing prisoners and parolees for drug use. The plans must cover how inmates will be selected for testing, how frequently random testing will occur, and what the "escalating range of responses" will be for those who test positive repeatedly. The plans may be modified after review by the CPO, and must be in effect by September 1. States that do not meet these requirements will be ineligible for federal prison funds. Although many states are already testing prisoners and parolees for drug use, this is the first time they have been required by Congress to do so.



Food

Wild-mushroom season begins this month, and record numbers of mushroom hunters are likely to be on the trail: according to a recent poll of chefs, exotic mushrooms are the "hottest" food in the country. Per capita consumption of fresh mushrooms has increased sixfold since 1970. Mushroom-related poisonings are also on the rise (last year more than a dozen people died or were hospitalized after eating uncultivated mushrooms). Serious poisonings are most likely to result from eating raw mushrooms; cooking neutralizes the toxins in some varieties. There are those who go so far as to advise against eating any mushrooms raw, even the familiar white cultivated ones: all mushrooms contain a known carcinogen, albeit in minute amounts.



Arts & Letters

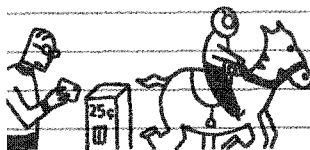
March 29: A major retrospective of the American sculptor Alexander Calder opens today at the National Gallery of Art, in Washington, D.C., to celebrate the centenary of his birth. Calder, who had a degree in mechanical engineering, is perhaps best known for his hanging and movable sculptures, which brought the words "mobile" and "stabile" into parlance in the art world; his 10-foot-high *Steel Fish* (1934) was one of the first "wind-driven" sculptures ever made. Other works in the exhibit are *Dog and Duck* (both 1909), completed when he was 11; his crank-driven *Goldfish Bowl* (1929), in which the fish "swim"; *International Mobile* (1949), made for the Third International Exhibition of Sculpture; and *Southern Cross* (1963). Many have not been shown publicly since a 1943 retrospective at New York's Museum of Modern Art. This exhibit will run in Washington until July 12 and travel to San Francisco's Museum of Modern Art in September.

Environment

Springtime greening is expected to start sooner than usual in the northern high latitudes this year. Data from satellite observations made since 1981 show that vegetation above about 45° N has been appearing earlier and earlier each spring. This spring's "green-up" is expected to occur roughly a week ahead of last year's. The phenomenon is part of a cycle known as



the "temperature/snow cover feedback effect," whereby bare ground, having absorbed more of the sun's radiation than snow-covered ground, grows warmer, causing nearby snow to melt; this in turn raises air temperatures and encourages plant growth. Because temperatures have been gradually increasing, the effect has become more pronounced each year. Responses to the progressively earlier springs in recent years include earlier nesting among birds in the United Kingdom, changes in some migratory patterns, earlier thawing of some Canadian lakes, and increased calving among caribou in the Arctic.



Demographics

This month residents of a community that has been called "the town of the future" will become, in a sense, consumers of the future. Citizens of the technology-focused planned community of Celebration, Florida—a town built by the Walt Disney Company—will begin carrying virtual cash in the form of "stored-value cards" issued by Visa and SunTrust Banks. The cards, also called "chip cards" and "smart cards," are embedded with computer chips that keep a record of monetary sums. Unlike conventional bank or credit cards, stored-value cards do not require connections to a network; instead, when purchases are made, the amounts are deducted from the card itself and transferred to the merchant. In addition, the cards can or may soon be used to feed parking meters and vending machines and to store information ranging from frequent-flyer miles to fingerprints and medical histories. This month's trial is the first to take place in a planned community.

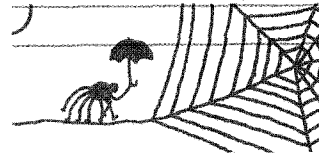


The Skies

March 1: The slim crescent Moon is visible above Saturn in the west at dusk. 4: The half Moon passes in front of the red star Aldebaran early this evening. 10: Mercury and the much dimmer Mars lie close together on the western horizon at dusk. 12: Full Moon, also known this month as the Lizard, Sap, and Awakening Moon and the Moon of Snow Blindness. 20: At 2:55 P.M. EST, the Vernal Equinox; winter ends. 24: Venus lies to the left of the slim crescent Moon about an hour before sunrise.

75 Years Ago

Carl Sandburg, writing in the March, 1923, issue of *The Atlantic Monthly*: "Poetry is an art practised with the terribly plastic material of human language. . . . Poetry is a puppet-show, where riders of skyrockets and divers of sea fathoms gossip about the sixth sense and the fourth dimension. . . . Poetry is the journal of a sea animal living on land, wanting to fly the air. . . . Poetry is a search for syllables to shoot at the barriers of the unknown and the unknowable. . . . Poetry is the cipher key to the five mystic wishes packed in a hollow silver bullet fed to a flying fish. . . . Poetry is a fresh morning spider-web telling a story of moonlit hours, of weaving and waiting during a night. . . . Poetry is a pack-sack of invisible keepsakes. . . . Poetry is the capture of a picture, a song, or a flair, in a deliberate prism of words."



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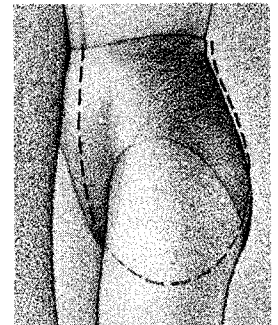
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Instead of the usual, abrupt men's "V."

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a "rise" that follows your
natural contour

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A change here, a change there

While we were at it, we also switched our 100% cotton denim fabric to a *left-hand twill* – the opposite of almost everybody else's.

This is the old, original way of weaving denim. It produces a looser, softer fabric – especially after washing.

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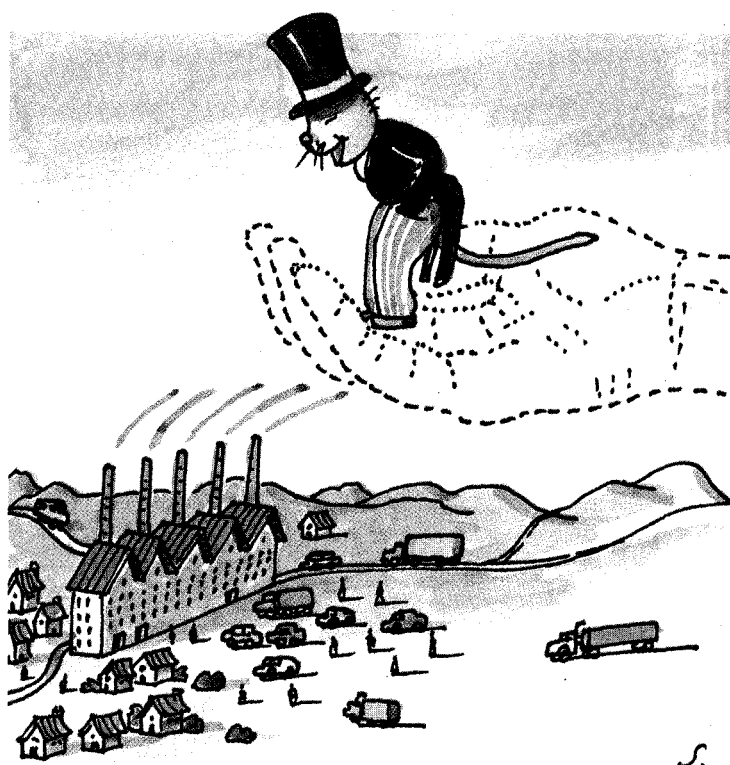
Today's Most Mischievous Misquotation

Adam Smith did not mean what he is often made to say

ONE of the most often distorted passages in economic literature is surely Adam Smith's aside about the invisible hand of the market. In *Economics*, which has been the leading college text on the subject since the 1950s, Paul A. Samuelson and William D. Nordhaus concocted a typical variant of Smith's actual remarks. They pulled them from the midst of a paragraph hundreds of pages into *The Wealth of Nations*, presumed to streamline the prose by chopping and splicing without using ellipses, and elevated the result into the theme of Smith's entire thousand-page book.

Every individual endeavors to employ his capital so that its produce may be of greatest value. He generally neither intends to promote the public interest, nor knows how much he is promoting it. *He intends only his own security, only his own gain. And he is in this led by an invisible hand to promote an end which was no part of his intention.* By pursuing his own interest he frequently promotes that of society more effectually than when he really intends to promote it. [italics added]

This makes Smith sound as if he thought that the invisible hand always leads individuals who are pursuing their own interests to promote the good of society. He did not. He saw the interests of large capitalists as conflicting with those of the public: capitalists seek high profits, which corrupt and impoverish soci-



ety. In another example the famous division of labor increases factory output but erodes the intelligence, enterprise, and character of workers. Smith's passage on the invisible hand says only that it operates "in this as in many other cases"—not always, not even mostly.

The "case" that Samuelson and Nordhaus edited out is about trade, and on this Smith said something indeed strange to modern economists' ears. Before the passage that Samuelson and Nordhaus excerpted, Smith had argued that

investment at home produces more "revenue and employment" than investment in foreign trade. In the key sentence about the invisible hand, which Samuelson and Nordhaus reworked into the italicized portion of the quotation, Smith further argued that self-interest does lead the entrepreneur to invest at home rather than in foreign trade.

By preferring the support of domestic to that of foreign industry, he intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention.

The invisible hand promotes the good of society by leading entrepreneurs to invest at home rather than abroad.

Was Adam Smith not a free-trader after all? That is the

by Jonathan Schlefer



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wrong question. We tend to lump trade policies into either of two categories: free trade or protectionism. Smith was concerned with a third category: mercantilism, a system and ideology, fostered by merchants, that both promotes and manages trade. *The Wealth of Nations* is an extended polemic against mercantilism.

Smith attacked the way British mercantilism divvied up the world into parcels, granting merchants corporate monopolies to trade with each: the Russia Company, the Hamburg Company, the African Company, the South Sea Company, and that great bed of waste and corruption the East India Company. Lured by monopolistic profits, “private persons frequently find it more for their advantage to employ their capitals in the most distant carrying trades of Asia and America, than in the improvement and cultivation of the most fertile fields in their own neighbourhood.” Smith likewise railed against fighting colonial wars “for the sole purpose of raising up a nation of customers.” He raised a point that we might at least consider: is our globalization just a new mercantilism?

Smith held that a nation’s wealth lies first in agriculture, to supply its people with ample food; second in domestic industry, to furnish everyday needs; and distinctly third in securing merchandise “of the finer kind” through trade. Unfortunately, Europe emerged from the Middle Ages in an “unnatural and retrograde” manner. Merchants in cities, relatively free from the repressive grip of feudal lords, began trading to secure luxuries from the Muslim empire and Byzantium. Gradually, urban artisans learned to manufacture local goods to replace traded articles. Only last did this commerce erode inefficient feudal estates, so that yeomen farmed their own plots, thereby raising yields and better feeding the populace. Powerful merchants who had led the way from feudalism were able to secure a system that put trade first, domestic manufacturing second, and agriculture last.

Smith’s argument is ultimately about values—not surprising given that before serving as commissioner of customs in Edinburgh, he was a professor of moral philosophy. Modern economists do not admit this sort of argument: if poor people buy traded merchandise “of the finer kind” rather than agricultural produce, then that is their system of values. Smith made judgments about values, which he saw mercantilism as distorting. The “enormous” sums spent on a reception for a new viceroy in Peru served “to introduce . . . the habit of vanity and expense upon all other occasions.” Such distorted values in turn distort industry. Spain and

crops. Although the English East India Company had “not yet had time to establish in Bengal so perfectly destructive a system” as the Dutch, Smith maintained that “the government of an exclusive company of merchants is, perhaps, the worst of all governments for any country whatever.” He saw the limits of privatizing government services, to put it mildly.

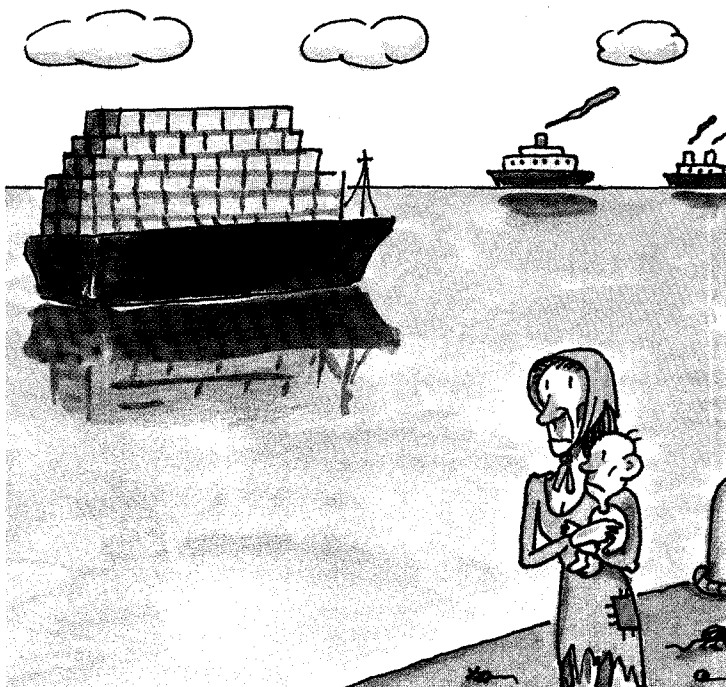
Oppressive abroad, mercantilism was unjust at home.

It is the industry which is carried on for the benefit of the rich and the powerful, that is principally encouraged by our mercantile system. That which is carried on for the benefit of the poor and indigent, is too often, either neglected, or oppressed.

Large cloth manufacturers secured regulations favoring the import of yarn to cut their costs. This lowered the income of British spinners, “poor people, women commonly, scattered about in all different parts of the country, without support or protection.” At the same time, by “extorting” subsidies from the government for exporting cloth, big manufacturers further increased their profits.

Smith’s prescriptions for these ills are of de-

batable value, and extending them to our times is rash. Still, some things he said resonate across the centuries. Today’s globalization, whatever its benefits, has a strange way of favoring the successors to those merchants and manufacturers who promoted mercantilism in Smith’s day. Dani Rodrik, of the John F. Kennedy School of Government, at Harvard University, an economist who supports free trade, nevertheless concludes in a study of a large number of nations that “globalization reduces the ability of governments to spend resources on social programs; it makes it more difficult to tax capital; and a growing share of the tax burden is now carried by labor.” In supposed exemplars of free trade like Argentina and Mexico, a cluster of powerful export firms backed by state subsidies are flourishing. Though



Portugal, epitomes of mercantilism, sent galleons chasing after gold and silver while neglecting farming and manufacturing at home: “Have the exorbitant profits of the merchants of Cadiz and Lisbon augmented the capital of Spain and Portugal? Have they alleviated the poverty, have they promoted the industries of those two beggarly countries?”

British mercantilism was less damaging only because less extreme. Yet Britain squandered its treasury and the lives of its citizens in fighting the French and Indian War and the American Revolution, in Smith’s view, so that its merchants could monopolize trade with the Colonies across the Atlantic. Elsewhere trading companies wielded sovereign power over foreign peoples for corrupt ends—for example, increasing profits by burning spice

Smith railed against such subsidies (or industrial policies), they probably did strengthen British industry, and today's global competition gives developing countries a better case for using them. The problem is that Argentina and Mexico, like England in Smith's day, have simply let the poor grow poorer.

By 1980 industrial tariffs among the advanced nations were already low. The new wave of free trade seeks other forms of globalization that Smith might have called mercantilist. Our so-called Structural Impediments Initiative with Japan forced that country to let Toys R Us and other big commercial chains compete with mom-and-pop stores. Must we foist our dreariest institutions on the rest of the world? Regulations in treaties enforce trademarks that give multinationals a huge advantage over small local firms and arguably distort values. The Marlboro Man is alive and well on Third World television screens. Is this costly and excessive promotion not in some sense a modern counterpart to the installation of Peruvian viceroys or the East India Company's corporate privilege?

In other areas our treaties do promote free trade, but in ways that Smith, always guarded in his support of markets, would have regulated. Rules bar countries from blocking international financial flows like those that have triggered crashes and recessions in numerous nations. But only by limiting the ability of speculators to shuttle funds across borders in search of higher returns can a nation regulate interest rates. And Smith advocated regulating interest rates, limiting them to five percent in Britain in his day. Otherwise shortsighted bankers would seek exorbitant interest by lending to "prodigals and projectors," whose speculative schemes would lead to crashes. At five percent bankers would prefer making secure loans to "sober people" who invested in real production of goods and employed workers.

In some areas, including finance, protectionism is appropriate; in others, no doubt, free trade; in yet others, contra Smith, trade promotion. These matters should be considered on their merits, not lumped under the banner of globalization. As Smith said, "Those exertions of the natural liberty of a few individuals, which might endanger the security of the whole society, are, and ought to be, restrained by the laws of all governments." ☛

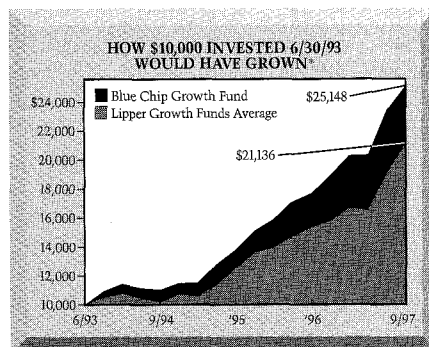
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California, Here We Come

*Government by plebiscite, which would
have horrified the Founding Fathers, threatens
to replace representative government*

THIS June marks the twentieth anniversary of the passage of Proposition 13, the California voter initiative that has in many respects had a political and social impact on this era—not just in California but across much of the nation—almost as profound and lasting as that of the New

Deal on the 1930s, 1940s, and 1950s.

The effect on California—which had been well above the national average in what it spent to educate its children, to provide free or nearly free higher education to every person who wanted it, for highway construction, and for a range of social services for children and

by Peter Schrag

the needy—was traumatic. Cutting local property taxes by more than 50 percent and capping the tax rate at one percent, Proposition 13 and the various initiatives that followed in its wake forced California to a level of spending far below the national average for such things as K–12 schooling, public-library services, the arts, and transportation. The respected journal *Education Week* said last year of California schools, “a once world-class system is now third-rate.” Even with a booming economy, California remains in the bottom third among the states, and far below the other major industrial states, in what it budgets per pupil.

Just as important, the march of ballot initiatives, the attack on legislative discretion, and the related acts of “direct democracy” that Proposition 13 helped to set in motion—involving taxes and spending, affirmative action, immigration, school policy, environmental protection, three-strikes criminal sentences, term limits, campaign reform, insurance rates, and virtually every other public issue—continue with unabated force, in California and beyond. In November of 1996 voters in twenty-three states were polled on a total of ninety initiatives, the most in more than eighty years (a decade ago there were forty-one), on everything from hunting rights to gambling to logging regulations to sugar production to the legalization of medical marijuana use (which was approved in Arizona and California).

This June, as if to honor the anniversary of Proposition 13, Californians will again confront a large array of sometimes nearly incomprehensible ballot measures, among them yet another one on term limits and one that would all but end bilingual education. Each proposed reform further restricts the power of the legislature and local elected officials to set priorities, respond to new situations, and write budgets accordingly. When half of the state’s tax-limited general fund must, under the terms of one initiative, be spent on the schools; when a sizable chunk must, under the mandate of the state’s three-strikes measure, be spent on prisons; and when lesser amounts must, under the terms of still other initiatives that have been approved in the past decade, be spent on the repayment of bonds for parkland

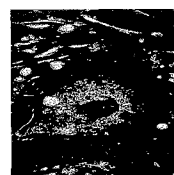
Her science teacher taught her about discovery. Now she's discovering ways to fight cancer.



Pam Hunt
pharmaceutical company researcher

"When I was eight, my mother died. Fortunately, a biology teacher took me under his wing. He taught me a lot about science. But mostly he made me feel 'Hey, I can do this.'"

"Today, I'm a pharmaceutical company researcher. At my company we're developing a new drug that may help cancer patients get their blood platelet numbers back up to normal after chemotherapy. Restoring blood platelet counts is critical for the effective treatment of the disease. The idea that the drug I'm working on could one day help cancer victims makes me feel very proud."



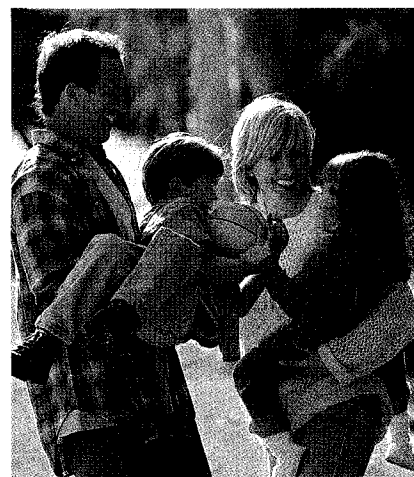
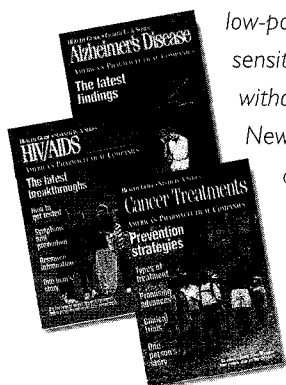
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and transportation projects, the amount left over for everything else shrinks with Malthusian inevitability—as does the state government's capacity to cope with changed circumstances. When cities and counties are prohibited from raising property-tax rates beyond Proposition 13's one percent, and when it is difficult to raise other revenues without a vote of the electorate (in many instances a two-thirds vote) or of the affected property owners, local control is drastically reduced.

Just as inevitably, public policy is increasingly distorted by the shifting of costs from the general fund to the Byzantine system of fees, assessments, and exactions that local governments have devised in their attempts to get around tax limits and other restrictions. This reinforces the larger shift from a communitarian to a fee ethic—in the support of parks and playgrounds, in the construction of new schools, and in financing a range of other services that used to be funded entirely from general taxes. As one California letter writer complained to a newspaper, why should citizens contribute to “the methodical pillaging and plundering of the taxpayer, forcing those who have no kids to pay through the nose for someone else's”?

Direct democracy is an attractive political ideal, as close to our own experience as the New England town meeting. It has never worked, however, in large, diverse political communities, and the belief that electronics, direct mail, and televised slogans can replace personal engagement has so far looked far more

in government less than it wants an autopilot system to check government institutions with little active involvement by the citizenry beyond occasional trips to the polls to vote on yet more initiatives.

California sparked the anti-government, anti-tax mood that has gripped the nation for most of the past two decades, and it remains the most extreme illustration of that mood, a cautionary tale for those enamored of plebiscitary democracy. But it is now hardly unique. Virulent anti-institutionalism, particularly with respect to government, has become a prevailing theme in our national political discourse. A decade after Ronald Reagan left office, his facile dismissal of government as “the problem,” not the solution, remains a talk-show staple, a posture that serves to exonerate both civic laziness and political ignorance. And this attitude, which has become banal toward representative government, now also encompasses the related institutions of constitutional democracy: the courts, the schools, the press. Voting and serious newspaper readership are declining together. The communitarian civic ideal that they represent is giving way to “markets,” a fee-for-service ethic, and the fragmented, unmediated, unedited exchange of information, gossip, and personal invective.

The media—new and old alike—may ensure against the power of Big Brother to dominate communications, but they also proliferate shared ignorance at an unprecedented rate: what used to be limited to gossip over the back fence is now spread in milliseconds to a million listeners during the evening commute, and to thousands over the Internet. And at the fringes are the militias and the “patriots,” collecting weapons and supplies, training in the hills, and hunkering down against the black helicopters and the coming invasion of United Nations troops. That kind of ignorance and extremism, the new media, and the surrounding paranoia about government have all become commonplace in the past decade. Oliver Stone's *JFK* and the videos promoted by Jerry Falwell about the alleged murder of Vincent Foster work the same territory.

Tracy Westen, the president of the foundation-funded Center for Governmental Studies, in Los Angeles, has constructed a “digital scenario” for the election of 2004—a not altogether wild fantasy about thirty-five California

voter initiatives on various subjects, all of which have been circulated for “signatures” online, along with a spectrum of arguments pro and con, available at the click of a voice-activated mouse, from every conceivable source. In combination with a number of new elective offices, including drug commissioner and gay-rights commissioner, those measures contribute to a total of 200 ballot decisions for each voter to make.

Among Westen's futuristic initiatives is one urging Congress to approve an amendment to Article V of the U.S. Constitution such that the language guaranteeing every state a “Republican form of government” is modified to permit the states to replace representative democracy with direct democracy. Westen points out that most of the technology for this politopia—individually targeted campaign ads, interactive “discussions” with candidates, electronic voting—already exists. Since “state legislatures seem to be fighting more and doing less . . . and leaving the real legislation to the people,” the scenario continues, “it seems the trend toward ‘democracy by initiative’ is inevitable.” A few years ago the Canadian fringe Democratech Party wanted to submit all government decisions to the public through electronic referenda. An official Democratech statement said,

Representative government assumes that the people need to elect someone to represent them in a faraway legislative assembly. But with modern, instantaneous communications, the people can directly make their own decisions, relegating politicians to the scrap heap of history.

THREE years ago *The Economist* mused about the possible benefits of replacing representative democracy with Swiss-style direct democracy, in which the voters “trudge to the polls four times a year” to decide all manner of plebiscitary questions. This process would prevent lobbyists and other special interests from buying the outcome, because “when the lobbyist faces an entire electorate . . . bribery and vote-buying are virtually impossible. Nobody has enough money to bribe everybody.”

California shows that the process of bedazzling voters with sound bites, slogans, and nuanced bias works as effectively in the initiative process as it does in electoral

Nothing in California's initiative process presents the downside or the implications of any issue.

like fantasy than like anything derived from hard political experience. In the case of the initiative, the new populism—unlike the reform movement that wrote the initiative into the constitutions of nineteen states around the turn of the century—seems to want greater engagement

MARCH
1999

Arts & ENTERTAINMENT

PREVIEW

FILM

The Eighth Annual
Ellie Awards

TV

A Little Folks
Psychohouse

MUSIC

Leonie Honne's
Being Myself

THEATER

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Film

BY ELLA TAYLOR

THE ELLA AWARDS FOR THE BEST OF 1997

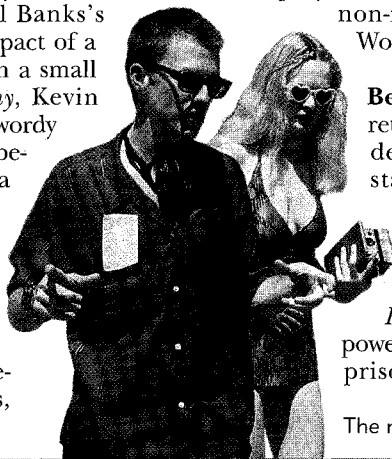
As independent film, colonized by Hollywood, moves steadily toward the middlebrow, the year's most elegant, intelligent, and heartfelt movie was a studio offering that failed to clean up at the box office but—if justice and decent marketing prevail—may sweep the Oscars.



Kim Basinger

Best Picture: Curtis Hanson's *L.A. Confidential* doffs its cap to James Ellroy's best-selling novel while lifting it out of pulp fiction into a funny, smart, ardent morality play about the brash humanity of 1950s Los Angeles.

Runners-up: Atom Egoyan's *The Sweet Hereafter*, an artful yet faithful homage to Russell Banks's novel about the impact of a school-bus crash on a small town; *Chasing Amy*, Kevin Smith's deliriously wordy rumination on misbegotten love between a callow youth and a lively lesbian; Barry Sonnenfeld's hilarious *Men in Black*, in which Will Smith and Tommy Lee Jones dally with special-effected aliens, cute and otherwise.

The making of *Boogie Nights*

Best Newcomer: The director Paul Thomas Anderson, for his assured debut features, *Hard Eight* and *Boogie Nights*.

Runner-up: The director Greg Mottola, for *The Daytrippers*, a stylish, talk-driven chamber piece about a family's disastrous outing in Manhattan.

Best Foreign-Language Picture: In the tradition of Ken Loach, Jean-Pierre and Luc Dardennes's searing docudrama *La Promesse* takes on the exploitation of illegal immigrants in contemporary Belgium.

Runners-up: *Chronicle of a Disappearance*, Palestinian director Elia Suleiman's playful yet quietly angry account of his journey to Israel to piece together his fractured identity as an exile; Jan Troell's *Hamsun*, a harrowing account of Norwegian Nobel Prize-winner Knut Hamsun's deluded love affair with the Third Reich; Jacques Audiard's *A Self-Made Hero*, an inquiry into the inner life of a French non-resister after the Second World War.

Best Actress: Julie Christie returns in quiet triumph as a destroyed former B-movie star pining for lost glory and a lost child in Alan Rudolph's *Afterglow*.

Runners-up: Ghita Norby, as the Nazi-loving wife in *Hamsun*; Emily Watson, powerfully restrained as the IRA prisoner's wife who falls for

Daniel Day-Lewis in Jim Sheridan's *The Boxer*; Helen Hunt, as the compassionate waitress who sees through Jack Nicholson in James L. Brooks's *As Good As It Gets*.

Best Actor: Max von Sydow, magnificent and abject as the literary lion broken by his alliance with Hitler in *Hamsun*.

Max von Sydow in *Hamsun*

Runners-up: Guy Pearce, moving without apparent strain from a flamboyant drag queen in *Priscilla: Queen of the Desert* to a buttoned-up career cop in *L.A. Confidential*; Robert Duvall, carrying the show as the flawed preacher in his own *The Apostle*; Al Pacino, dazzling as the has-been hood in *Donnie Brasco* and as a lawyerly Satan in *The Devil's Advocate*; Dustin Hoffman, as the Hollywood honcho who stage-manages a war with Albania in Barry Levinson's *Wag the Dog*.

Best Supporting Actress: Julianne Moore, for a daring performance as the schizoid, motherly porno queen in *Boogie Nights*.

Runners-up: Gloria Stuart, for her serenity and loud toenails as the 101-year-old survivor in James Cameron's *Titanic*; Kim Basinger, for her discerning hooker in *L.A. Confidential*; Gabrielle Rose, as the hapless bus driver in *The Sweet Hereafter*; Nathalie Richard, as the excitable lesbian wardrobe mistress in Olivier Assayas's *Irma Vep*.

Best Supporting Actor: Burt Reynolds, for his sly intelligence as the family-values pornographer in *Boogie Nights*.

Runners-up: Bruce Greenwood, as the monosyllabic mechanic who loses his children in *The Sweet Hereafter*; Rupert Everett, as Julia Roberts's pal, the only actor worth sticking around for in the otherwise stolid *My Best Friend's Wedding*; Robert Forster, returning in low-key style as the honorable bail bondsman in Quentin Tarantino's *Jackie Brown*.

ELLA'S SILVER TURKEY AWARDS

A *Life Less Ordinary*. If only. Danny Boyle's tepid tale of love on the lam between poor boy Ewan McGregor and poor little rich girl Cameron Diaz left *Trainspotting* fans wondering where had all the talent gone.

Jean-Jacques Annaud's *Seven Years in Tibet* felt like a lifetime in epic hell. Never mind that the hero was a Nazi.

Mike Figgis's *One Night Stand* felt like seven years in divorce court.

The Postman, or *Male Carrier*: Kevin Costner Plays God, Part III. Having danced with wolves and dried out a watery world, our

hero restores a pillaged futuristic America by overnight delivery. Piece of cake.

G.I. Jane. Bionic biceps and a foul mouth are all it takes for Demi Moore to make Navy SEAL. Piece of cake.

Air Force One. President Harrison Ford sees off what's left of Soviet communism while dangling from the wing of his own wounded aircraft. Piece of cake.

Ella Taylor is a film critic for LA Weekly.



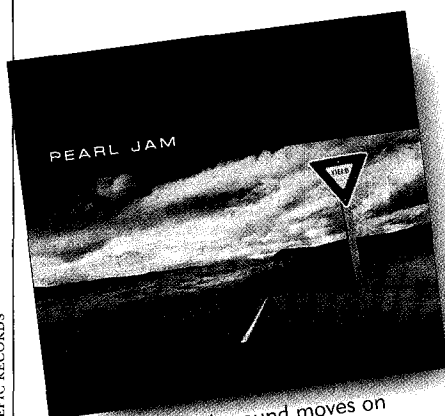
This postman won't ring twice

Popular Music and Jazz

BY BOB BLUMENTHAL AND CHARLES M. YOUNG

GROUP EFFORT

Despite a worshipful response to their multiplatinum first album, *Ten* (Epic), Pearl Jam inspired a certain cynicism and accusations of pretension and narcissism with their subsequent efforts. *Yield*, their fifth album, feels like a declaration of partial compromise with their critics. "I'm not trying to make a difference," Eddie Vedder chants in the song "No Way." But he hasn't given up his artistic ambition either. If he's yielding to anything, it's the creative process in the context of a group. All the members of Pearl Jam contribute fully to the writing here, and it feels like they've learned something about songcraft over the years, leading to a band and an album that are greater than the sum of



The Seattle sound moves on

their parts. Stone Gossard and Mike McCready have been justly celebrated as a guitar duo, providing grit in the riffs and fire in the solos throughout their career, but have achieved here an organic interplay and musicality that equals and sometimes transcends *Ten*. The bassist Jeff Ament contributes two songs: "Pilate," about losing yourself (inspired by the novel *The Master and Margarita*), and "Low Light," about finding yourself. Not a new theme, exactly, but certainly an apt one at this point in his band's career. The opening cut, "Brain of J," is a frenzied, surreal speculation on the true outcome of JFK's autopsy, setting the tone with a bizarre element of modern mythology. Watch for the single "Given to Fly," about a benign messiah coming to terms with his power: the guitars are monstrous, and U2 will wish they wrote it. Given Pearl Jam's long-standing fight with Ticketmaster, there's no telling how or when or if they'll tour. If they do, it'll be an event. —C.M.Y.

FREE TO DO HER OWN THING

At age eighty, Lena Horne is looking as beautiful as ever. Her new album, *Being Myself* (Blue Note), reveals that the years have been just as kind to her voice.

One critic has described Horne's singing as "jazz-friendly rather than jazz as such," but her mobile phrasing and quietly insistent beat are as much the mark of a jazz singer as scat interludes. She knows how to inhabit her material, a talent that gives her interpretations of such standards as "Imagination" and "Willow Weep for Me" the weight of an instrumental improvisation.

Horne has stated that with age she has been freed of the need to conform to show-business stereotypes. In the context of *Being Myself* this means that the oversized productions that usually surround



Lena Horne as herself

vocal icons have been stripped away. Only two tracks include a string section, and these remain within the intimate bounds of the other performances, in

which Horne is supported by a rhythm section and an occasional saxophone. This is the equivalent of an unretouched photo for someone of Horne's age, yet her voice retains the insinuating strength that has always marked her work.

She gets help from several outstanding musicians in sustaining the after-hours mood, with major credit going to Rodney Jones, her producer and guitarist, a probing experimenter in other contexts who trims his conceptual sails for bluesy solos on "How Long Has This Been Going On?" and "After You" that almost upstage the diva. —B.B.

NOT FAR FROM THE MADDING CROWD

In interviews to support last year's double live album *Living in Clip* (Righteous Babe), Ani DiFranco disparaged much of her past studio work as sterile. Her first love is performing, she explained, and she needs crowd chemistry to emote properly. Most of her



Punk-folk diva Ani DiFranco

fans would disagree with that analysis, and on her latest studio album, *Little Plastic Castle*, they have conclusive evidence that they're right. Not that they needed much. Since founding her own label, at the age of twenty, in 1990, DiFranco has built a legend on her spectacular reinvigoration of folk music and her ferociously independent business sense in refusing

to sign with any of the usual entertainment conglomerates. Accompanied by bass, drums, her own acoustic guitar, and an occasional horn on *LPC*, DiFranco emotes properly and then some, hooking you with the versatility of her voice and the mostly mid-tempo grooves of her band. She does not hook you with simplistic sentiments and booming, chanted choruses. In other words, she writes like a poet rather than a lyricist, and you have to listen more than once to figure out what's going on. And what is going on? DiFranco cogitates on the individual versus the generic, the real versus the unreal, history versus the minute details that make and break relationships. Her feminism emerges at odd intervals when she wants to underline a larger point, but it's well anchored in sharp, original observation. Sometimes she dispenses with words altogether, vocalizing in something that is halfway between baby talk and scat singing. Whether she's articulating or inarticulating, DiFranco leaves you with that feeling of freedom that just isn't available on television. —C.M.Y.

Bob Blumenthal is a jazz critic for The Boston Globe.

Charles M. Young reviews popular music for Playboy, Musician, and other publications.

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C H R Y S L E R



E N G I N E E R E D T O B E G R E A T C A R S

Dance and Theater

BY NANCY DALVA AND JOHN ISTEL

ART



WHAT IS IT?

When Sean Connery's wife, Micheline Roquebrune, saw *Art* in Paris, she persuaded her husband to try to option the smash-hit play as a film vehicle for himself. But the playwright—thirty-seven-year-old Yasmina Reza—insisted on having it produced onstage in London and New York first. Connery and his co-producer, David Pugh, coughed up the funds, and their critically acclaimed West End production, directed by Matthew Warchus, recouped their investment in seven weeks. Warchus now directs the award-winning comedy on Broadway (March 1; 212-239-6200). Alan Alda, Alfred Molina, and Victor Garber play three close friends—Serge, a dermatologist; Marc, an aeronautical engineer; and Yvan, a wholesale-stationery salesman—who could be characters in a *Seinfeld* spinoff as written by Roland Barthes or Jean Baudrillard. When Serge buys an all-white piece of modern art for 200,000 francs, Marc's disdain threatens the trio's long friendship. Some critics questioned whether the play, like the central piece of art, is a case of the Emperor's New Clothes. But Reza, especially in Christopher Hampton's translation, never lets the play take itself too seriously. It's clear that the dermatologist's knowledge of deconstruction, for example, is only skin deep. It's a play that flirts with big ideas but never engages them. It's too busy having fun at its characters' expense and provoking laughs that make this ninety-minute piece of art seem like a good deal. —J.I.

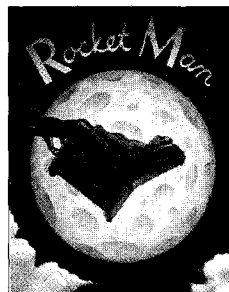
Nancy Dalva is the author of *Dance Ink: Photographs*.
John Istel is a senior editor at Stagebill.

IT'S LONELY OUT THERE IN SPACE

Two years ago Arizona Theatre Company, under the guidance of artistic director David Ira Goldstein, produced the world premiere of Steven Dietz's *Private Eyes*. A crafty, careening play-within-a-play, Dietz's dizzy romantic comedy focused on a love triangle composed of an actor, his co-star and wife, and the director with whom she's having an affair. Not only did it explore love affairs in the theater, but its Pirandellian dramaturgical pirouettes conveyed Dietz's love affair with the form of theater itself. More than a dozen companies are mounting Dietz's play this season.

Rocket Man (February 26–March 25; 520-622-2823) is Goldstein's sixth Dietz debut and third joint project with

the author in Arizona. "It's like *Lonely Planet*, only backwards," says Goldstein, referring to Dietz's off-Broadway hit AIDS allegory of a few seasons ago, in which a cartographer slowly fills his shop with dozens of chairs symbolizing friends who have died. *Rocket Man* takes a similarly sentimental absurdist tack: Donny, a landscaper, has ensconced himself in his attic, trying to access a parallel universe. As the play moves chronologically backward, the clutter disappears, leaving Donny alone in his recliner. Goldstein and Dietz's collaboration, however, continues to move forward through time, even as their subjects look back: ATC has commissioned Dietz to write a musical about, of all things, the Lincoln-Douglas debates. —J.I.



Dietz's newest play

PUTTING MEMORIES INTO MOTION

In the age of the memoirist as navel gazer, Neil Greenberg's work proves that the most specific of autobiographers can, through intelligence and craft, make dances that possess general implications for a wide audience. In *Not-About-AIDS-Dance* (1994), *The Disco Project* (1995), and the new *Part Three* (itself a trilogy) he dances about his life and times, linking the three pieces with signature movement motifs. He also turns to words, with simple statements of fact about dancers and projections of their history on the backdrop. Linked to the beautiful physical presence of the performers, this fragmented narrative, freighted with sad happenings, is surprisingly resonant, and anything but a gimmick. How does Greenberg not merely get away with but triumph in personal history, slide projections, literary effects—areas where lesser artists drown? Simplicity, directness, clarity, and his own disposition are the keys. Greenberg's choreographic voice is a singular mixture of the wrenching and the joyous: you can search his work for symbols (the pink of the Nazi triangle, the posturing of Judy Garland, the death of his brother—which is not only symbolic but also very real) and find it dark, or you can take pleasure in its sheer exuberance and find it filled with light. Greenberg jumps from shadow into spotlight with

endearing and affecting joie de vivre, morphing memory into choreography. (March 31–April 5; 212-996-1100). —N.D.

BREAKFAST
with
THE ARTS

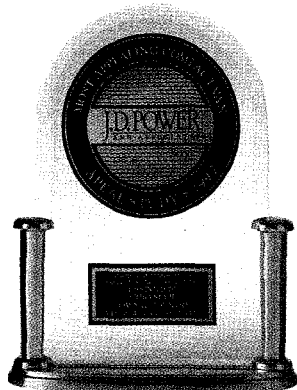


In March tune in to the A&E Network on Sunday mornings at 9:00 A.M. for "Breakfast With the Arts"—a two-hour program devoted to the performing arts. Each week your host, Elliott Forrest, focuses on the best performances of opera, classical music, dance, theater, rock, jazz, folk, and contemporary popular music. So sit down to breakfast, tune in, and make your Sunday morning a cultural experience. Chrysler is proud to be a patron of the arts by sponsoring the March 8 and 22 broadcasts of "Breakfast With the Arts" and this month's Arts & Entertainment Preview.

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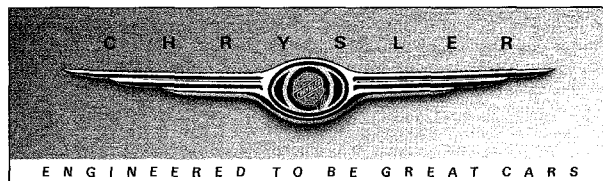


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politics. Offers that sound like something for nothing (a 50 percent property-tax cut, or a guaranteed level of education funding, or a state lottery offering a payoff for schools as well as for the lucky winners) may not be bribes, but they are the nearest thing to them. And when they work at the ballot box, their effects may last far longer than those of conventional legislation.

The larger danger, of course, is precisely the nondeliberative quality of the California-style initiative, particularly in a society that doesn't have the luxury of slow alpine trudges during which to reflect on what it's about to do. Nothing is built into the process—no meaningful hearings, no formal debates, no need for bicameral concurrence, no conference committees, no professional staff, no informed voice, no executive veto—to present the downside, to outline the broader implications, to ask the cost, to speak for minorities, to engineer compromises, to urge caution, to invoke the lessons of the past, or, once an initiative is approved by the voters, to repair its flaws except by yet another ballot measure (unless the text of the initiative itself provides for legislative amendment). Indeed, if the past decade of initiatives in California demonstrates anything, it is that the majoritarianism essential to the ethos of direct democracy almost inevitably reinforces an attitude of indifference if not hostility toward minority rights. All these dangers would be exacerbated, of course, by electronic or other forms of absentee balloting, whereby voters would no longer be required to go to the local school or church or social hall and encounter their fellow citizens participating in the same civic ritual—and thus be reminded that they are, after all, part of a larger community.

To say all that, probably, is merely to say awkwardly what the Framers of the Constitution said better in Philadelphia, what Hamilton, Madison, and Jay said in *The Federalist*, and what scores of delegates said in 1787–1788 at the various state conventions leading up to ratification, even before the Terror of the French Revolution: unchecked majorities are a danger to liberty almost as great as oligarchs and absolute monarchs.

AMONG the most common measures, put on the ballot by the organization U.S. Term Limits in fourteen states and passed in 1996 by voters in nine, is the

“Scarlet Letter” initiative, also known as the “informed voter” initiative, which instructs a state’s elected officials to support a constitutional amendment limiting members of the House of Representatives to three two-year terms and members of the Senate to two six-year terms, and which requires state election officials to indicate on the ballot next to the name of each congressional incumbent and each member of the legislature whether he or she “disregarded voters’ instruction on term limits.” It also requires nonincumbents to indicate whether they have signed a pledge supporting the amendment; those who have not will be similarly identified on the ballot. For Paul Jacob, who heads U.S. Term Limits, no compromise is acceptable. The watchword is “No Uncertain Terms” (which also happens to be the name of the organization’s newsletter).

Jacob’s very inflexibility helped to derail a more moderate term-limits amendment when it came up in the House (for the second time) early last year. It would have allowed six two-year terms in the House and two six-year terms in the Senate. By denouncing it as a sellout, U.S. Term Limits helped to ensure that no term-limits amendment was approved, and thus that the organization would enjoy a long, healthy life. The large turnover in Congress in 1994 probably took enough steam out of the movement to reduce its chances of success, but not enough to end it.

The Scarlet Letter initiative is probably unconstitutional. (U.S. Term Limits is now asking individual candidates to pledge to serve no more than three terms in the House or two in the Senate.) In Arkansas, one of the nine states that passed it in 1996, the state supreme court struck it down, as a violation of the procedures set forth in the U.S. Constitution for amendment. Because the drafters of the Constitution, in the words of the Arkansas court, “wanted the amending process in the hands of a body with the power to deliberate upon a proposed amendment . . . all proposals of amendments . . . must come either from Congress or state legislatures—not from the people.” The U.S. Term Limits measure was “an indirect attempt to propose an amendment . . . [that would] virtually tie the hands of the individual members of the [legislature] such that they would no longer be a deliberative body acting in-

dependently in exercising their individual best judgements on the issue.”

There are scattered indications that the rabid anti-government fervor of the early nineties may have peaked. (One of those indications, in the view of Nancy Rhyme, who tracks the issue for the Na-

Ballot initiatives reduce the power and accountability of legislatures—and thus the ability to govern.

tional Conference of State Legislatures, is that only nine states passed the Scarlet Letter initiative.) Certainly, term limits are not likely to be written into the Constitution any time soon.

But the issue will not go away, either in national politics or in the eighteen states that now have term limits for their legislatures written into their constitutions or otherwise written into law. On almost the same day that term limits failed (again) in the House early last year, the Scarlet Letter, funded largely by U.S. Term Limits and a handful of out-of-state term-limits organizations, qualified for the next California ballot. (U.S. Term Limits kicked in about \$300,000 to the campaign to qualify the California “informed voter” measure but won’t, of course, disclose where its money comes from. The organization is willing to provide a list of its National Finance Committee members, all of whom are said to have contributed more than \$1,000, but will not specify which among them are its largest contributors.) A few months later the long-established California organization Field Poll reported that voter support of term limits, which stood at roughly two thirds, remained just as strong as it had been in 1990, in the months before California approved term limits for legislators and other state officials.

NOR has the initiative process lost its allure. Twenty-four states have some form of initiative in their constitutions, most of them dating from the Progressive

Era. Recently there have been moves in a number of other states—including Rhode Island and Texas—to write the initiative process into their constitutions.

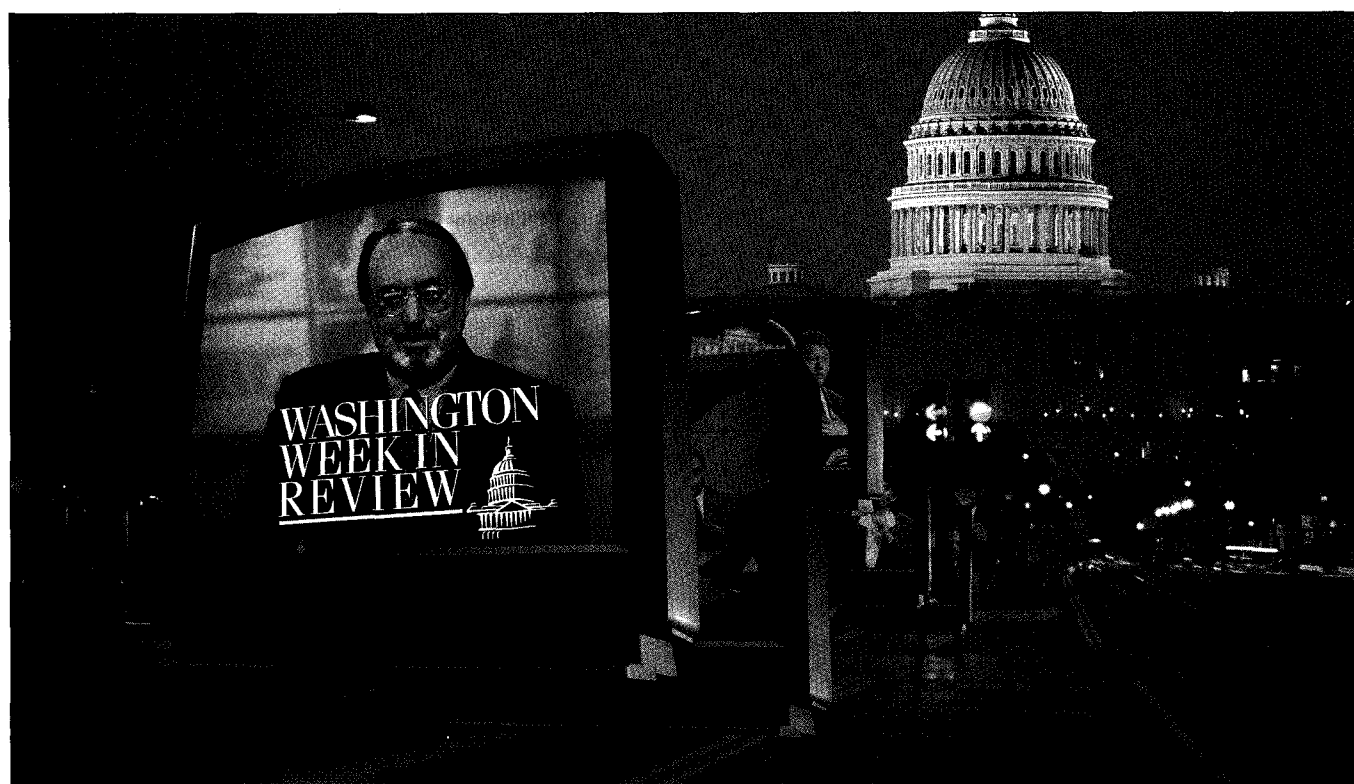
The pressure does not come from Hispanics or other newly active political groups, who tend to vigorously oppose these constitutional changes as openings to yet more measures like California's Proposition 187—which, until it was blocked by a federal court, sought to deny schooling and other public services to illegal immigrants. Rather, the impetus is from Ross Perot's United We Stand America and other organizations that are overwhelmingly white and middle-class. And in the states that already have the ballot initiative, there is increasing pressure to use it, sometimes generated by the dynamics of political reform itself. In California, political officeholders, from the governor down, have become initiative sponsors as a means of increasing name recognition and raising or stretching political campaign funds. And as initiatives circumscribe the power and discretion of legislatures, often the best way of responding to new circumstances—and

sometimes the only way—is through yet another initiative. The result, for better or worse, is an ongoing cycle of initiative reform, frustration, and further reform.

Yet despite all the unintended consequences and the inflexibility of the initiative and other devices of direct democracy, they seem to have one thing in common, whether they are used by liberal environmentalists or by tax-cutting conservatives: they are the instruments of established voter-taxpayer groups, particularly the white middle class, against urban politicians and political organizations that represent the interests and demands of minorities, immigrants, and other marginal groups. At the turn of the century the Yankee establishment in Boston and other cities sought to create political institutions and devices to dilute the power of the upstart Irish. In its impulse and spirit the current pressure for plebiscitary solutions driven by the general electorate, in which the white middle class can still dominate, is not all that different.

The celebratory history of direct democracy centers on its inclusiveness, but in our politically more sophisticated (and no

doubt more cynical) age there is a need to understand that defense of the initiative may be less disinterested than it seems. The groups that embrace and cheer it are not just "the people" fighting "the interests" or "the politicians," much less battling "Satan" and "Mammon," as the editor of the *Sacramento Bee* put it in the heyday of the Progressives. They are often established political interest groups trying by extraordinary means to further a cause or repulse the advances of other groups. More important, each initiative reduces the power and accountability of legislatures—and thus the general ability to govern, meaning the ability to shape predictable outcomes. And whereas the initiative may well further the Jeffersonian objective of tying government down, and thus preventing mischief, it also vastly reduces the chances that great leaders, and the visionary statecraft with which they are sometimes associated, will arise. In the battle over the initiative the Framers would be the first to recognize that our politics, rather than being too conservative, are in the Burkean sense not nearly conservative enough. ☎



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Lewis and Clark and Us

*The expedition helped to forge
a great nation. How does it hold up as a
family vacation?*

THE map, folded delicately on cloth backing into a book-sized rectangle, slid easily out of its buckram case. Opened up, it expanded twenty-eight-fold to reveal the vast watersheds of the Missouri and Columbia Rivers, crossed by parallel strands of pointed mountains running north and south. I had asked John Lannon, the associate director of the Boston Athenaeum, if his library, a venerable repository, had anything in its holdings from the Lewis and Clark expedition, and he had replied, apologetically, that he

didn't have anything *directly* from the expedition, but he did have this one item...

Nicholas King was a mapmaker who lived in Washington, D.C., where he held the position of Surveyor of the City. One of the chief aims of the Corps of Discovery, the group under the leadership of Meriwether

Lewis and William Clark, was to chart a water route across North America, if one existed. Clark in particular was meticulous in his cartographic duties, recording celestial measurements and making detailed notes. He supplemented

firsthand observation of the route already traveled with secondhand reports of what lay ahead. Long before the expedition's end Lewis and Clark had sent maps and cartographic data back east—straight to President Thomas Jefferson—together with floral and faunal specimens. Jefferson forwarded the mapping materials to Nicholas King, who began assembling the information. The Missouri and its tributaries took shape in blue and black. The first stage of the map followed Lewis and Clark to Fort Mandan, in present-day North Dakota, where the corps spent the winter of 1804–1805. The journey continued from there across the plains of Montana to Great Falls and Three Forks; in fits and starts across the Bitterroot Mountains, a grueling passage; down the Columbia and through its majestic gorge to the Pacific; and then back, retracing many of the original footsteps, but with a swing to the south by Clark, following the Yellowstone River to its confluence with the Missouri.

King finished his map, taking in the whole American Northwest, even before Lewis and Clark returned to Washington, and he drew three copies. Months later, with the expedition's final notes in hand, he made extensive corrections on one of them, adding geographic features

Hidatsa village remnants, North Dakota; detail of the King map

by Cullen Murphy



RICHARD A. COOKE III/TONY STONE. MAP DETAIL: BOSTON ATHENAEUM

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and proper names. That was the copy on the table in front of me.

Some of the handwritten notations are believed to have been penned by members of the corps. Of the thirty-three men in the expedition's permanent party only one did not survive the trip—Charles Floyd, a victim of a burst appendix. On the map, near what is now Sioux City, Iowa, one can read in tiny script “Floyd’s grave.”

I MADE the acquaintance of the King map in advance of a 7,000-mile pursuit of the Lewis and Clark Trail with my family last summer. The impetus for this expedition was, of course, Stephen Ambrose’s *Undaunted Courage: Meriwether Lewis, Thomas Jefferson, and the Opening of the American West* (1996), a book of old-fashioned narrative history—unabashed in its nationalism, gruff in its enthusiasm, frank in its opinions, and a good yarn besides. The United States had acquired the vast Louisiana Territory, encompassing all or part of what are now fifteen states, from France in 1803, but entertained only a vague idea of what was actually in it. Thomas Jefferson assembled an expedition to find out more.

Ambrose quotes liberally from Jefferson’s instructions to Lewis describing what he expected. The instructions

display a Jefferson whose misinformation was sometimes endearing—for instance, he was intrigued by the idea that one tribe of Indians was descended from the Welsh, and he wanted Lewis to listen for evidence of this in the Indians’ speech—but

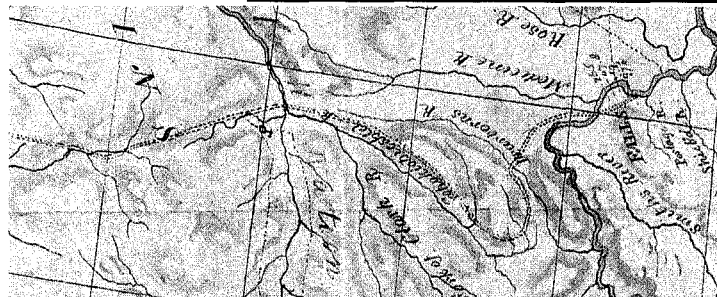
who was relentlessly curious, and far-seeing in his ambitions. No detail was beneath his notice. In admonishing Lewis to make multiple copies of everything he wrote, Jefferson urged that one of the copies be “on the paper of the birch, as less liable to injury from damp than common paper.”

Undaunted Courage has captivated

everyone I know who has read it. The book has also prompted many people to wonder if the Lewis and Clark saga might be an appropriate focus for a trip with children, “appropriate” here meaning not just worthy but practical. Are there sights and activities enough to hold the attention of young people? Can the long distances be managed in a manner that children will tolerate, even enjoy? The answer to such questions is yes.

SOME journeys in modern America have the effect of diminishing the achievement of those who made the same journeys hundreds of years ago. It is sometimes hard to appreciate, for instance, the barrier that the Appalachians once represented. A journey on the route taken by Lewis and Clark produces no belittling effect upon the imagination, perhaps because the Missouri River is so large and constant, and because the horizon at the end of the plains beckons unapproachably for so long. Moreover, the journals kept by Clark, by Lewis (though his have mostly been lost), and by many of the other members of the Corps of Discovery give a minutely detailed account of what happened on every day of the expedition. Over the years Lewis and Clark buffs and the government have pinpointed just about every campsite and put up historical markers and interpretive signs. There are reminders, every time you stop, of the demands posed by logistics, illness, and diplomacy, not to mention by an unruly and sometimes violent river whose course was dimly known.

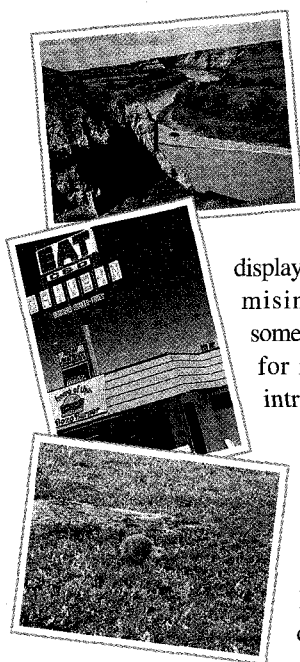
Lewis and Clark and the Corps of Discovery left the St. Louis area in a specially designed keelboat in May of 1804. The party returned in September of 1806 (without the keelboat). I and my wife, Anna Marie, and our three children, ages ten, twelve, and fourteen, left St. Louis in a rented Ford minivan in the middle of last July. We returned in the middle of August (with the minivan). Our strategy was to intersperse bursts of vast distance—say, 700 miles in a day—between stays of two, three, or four days at select-



ed spots. If we were to make the trip over again, we would stay longer in three specific areas. These stand out as offering not only a microcosm of the original Lewis and Clark expedition but also many historical sidelights and family amenities.

The first of these is the region around Bismarck, North Dakota. There is a fetching candor about this compact state capital (population: 53,500) on the Missouri. The capitol building is a modest Depression-era skyscraper, as if the government had insisted that some symbol of its power stand taller than the grain elevators. To a family hailing from Boston, a city like Bismarck boasts a touch of the exotic. The city also occupies a stretch of the Missouri that we came to appreciate as typical of the river: a powerful ribbon, fringed green with cottonwoods, and winding through a floodplain sharply defined by ocher bluffs and hills. (Karl Bodmer’s painting *View of the Bear Paw Mountains From Fort McKenzie* superbly captures the Missouri’s character.) From Fort Abraham Lincoln, on a grassy, windswept knob across the river, George Armstrong Custer set out in 1876 for his final destiny at the Little Bighorn.

The winter that Lewis and Clark spent just north of Bismarck, at the place they





A Lewis and Clark stop, on the Lolo Trail in the Bitterroots

called Fort Mandan, was crucial to their success. With the Mandan Indians they bartered for supplies to tide the corps over. Several Hidatsa villages lay nearby, at the confluence of the Knife River and the Missouri, and from the Hidatsa the corps obtained intelligence about the journey ahead. Among the Hidatsa, Lewis and Clark also found the young Shoshone woman Sacagawea, who had come from farther west and who would be an interpreter. At the Knife River Indian Villages National Historic Site the little that remains of these Hidatsa communities has been protected: when the sun is low, it reveals on a bluff above the river the shadowed depressions where earth lodges stood. Portions of the bluff that have been eroded sharply by water offer a cutaway view of archaeological strata—one can see clearly, for instance, places where hundreds of years ago buffalo bones were buried in middens. Our children meandered for half a mile, peering intently at the layers. The Knife River site, maintained by the National Park Service, offers a well-stocked visitor center but little in the way of modern restoration. It is an

excellent example of how intelligent commentary and modest display can make a natural setting speak across the ages.

The second area we would concentrate on is a tract beginning in Helena, Montana (another small and splendid state capital), and running up to Missoula and then west across the panhandle of Idaho. I had written to Stephen Ambrose in advance of the trip to ask what few things

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*We had a large-scale
map and plenty of
providence.*

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a family on an expedition such as ours, with limited time, should not fail to experience, and near the top of his list he put a length of the Missouri just north of Helena called Gates of the Mountains: "You must take the boat tour." If you want to see Gates of the Mountains—and you do—the river tour is, in fact, the fastest and most direct way; hiking into this six-mile stretch of sheer cliffs and dramatic gulches would take about a day. The trip

by motor launch opens up a secluded world of bald eagles and bighorns beneath a narrow, winding strip of sky.

One of the few places a boat can put ashore is where Lewis and Clark made camp on July 19, 1805. Lewis wrote,

This evening we entered much the most remarkable cliffs that we have yet seen. these cliffs rise from the waters edge on either side perpendicularly to the height of 1200 feet. . . . the river appears to have forced it's way through this immense body of solid rock.

From the campsite a long, strenuous hike leads to Mann Gulch, where a 1949 forest fire killed thirteen smoke jumpers—a tragedy recounted in the book *Young Men & Fire*, by Norman Maclean, better known for his memoir *A River Runs Through It*. The roof of an overhang the trail passes is marked by Indian pictographs.

Lewis and Clark had trouble getting across the western mountains. The high country was higher than what they had imagined, and more rugged, and it stretched on for longer. The mountains were covered with snow even in summertime. The expedition crossed the Continental Divide at Lemhi Pass, but the route from there became impassable; so Lewis



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and Clark turned north and followed the Bitterroot River until they came to an Indian trail along ridgelines in the Bitterroot Mountains at elevations as high as 7,000 feet. This is the Lolo Trail, and it runs for about a hundred miles from Lolo, Montana, near Missoula, to Weippe, Idaho, about two thirds of the way across the panhandle. A two-lane highway, Route 12, parallels the Lolo Trail, in some places closely and in others, where it follows the course of the Lochsa River, ten or fifteen miles to the south.

This is one of the great drives in America: the mountains drop right down to the Lochsa, whose crystalline waters trill over rounded stones, and then rise up sharply again on the other side. Near the beginning of this drive is an ordinary yellow road sign warning of sinuous roadway ahead—NEXT 77 MILES.

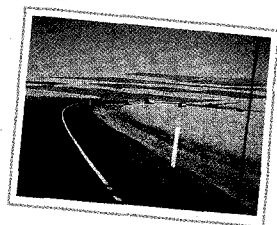
About our westward course along this stretch of Route 12 Ambrose had advised, "Turn right, follow almost any logging road to the top, and you are on the Lolo Trail, where the hiking is also superb." Those logging roads, fashioned from hard-packed earth, curl narrowly along steep drop-offs for ten miles or more, gaining three quarters of a mile in altitude, before hitting Forest Road 500, which braids in and out of the Lolo Trail. Here, high on the ridge, in the late summer of 1805, Lewis and Clark spent some of their most trying days—out of food, disoriented by a sudden snowstorm, and without the slightest evidence that the mountains would ever end.

Private Joseph Whitehouse wrote in his journal on September 16, 1805, "Camped in a thicket of Spruce pine & balsom fir timber. all being tired & hungry obledged us to kill another colt and eat the half of it this evening. it has quit Snowing this evening, but continues chilly and cold." Our experience of the place was different. We had a large-scale map and plenty of provender. The coolness was welcome. We made snowballs in late July, and peered from the trail through wooded slopes that tumbled downward at 60 degrees. A small herd of elk loped into intermittent view on a carpet of flowering bitterroot, as angled shafts of sunlight sliced between vertical shafts of trees.

The third area we should have explored longer is western Oregon, where Lewis and Clark, having reached the ocean,

settled in for the winter of 1805–1806. The quiet functionality and understated diversity of Portland is well known, and the city makes an easy base of operations. The Columbia River meets the Pacific at Astoria, a comely harbor town that retains something of a raw feel ("We Ain't Quaint!" is its unofficial motto) and that rises from waterfront to high ground and extraordinary views. The site of Fort Clatsop, Lewis and Clark's winter quarters, lies only a few miles away. "The fort has been reconstructed," Ambrose wrote in his letter, "and the living history program is outstanding (get them to show your kids how to start a fire on a rainy morning without matches or paper)." Starting a fire in wet weather was an urgent necessity for Lewis and Clark: during the more than three months they spent at Fort Clatsop, it failed to rain on only twelve days.

As it happened, we had cloudless sunshine, but Ambrose was right about the Fort Clatsop facility and its programs. The museum at the visitor center is excellent. One nice touch: outside the entrance, markers on a map of the Lewis and Clark route are moved with the passing days to show the location of the expedition west-



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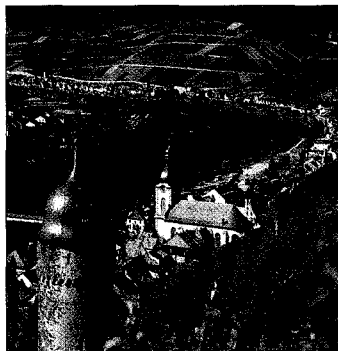
*The coolness was
welcome. We made
snowballs in late July.*

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ward in 1805 and eastward in 1806; journal entries from the same dates are posted alongside. Less than an hour from Fort Clatsop the Pacific crashes below the headlands and tall pines of Ecola Point. The salt air on a steady breeze proved to be a powerful restorative, and we just stood for a while, leaning toward Japan. William Clark wrote in his journal on November 7, 1805, "*Ocian in view! O! the joy.*"

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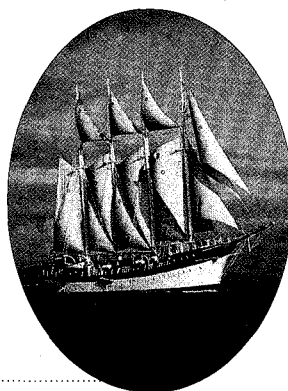
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THE strategy our family has adopted for long-distance travel—intense push, long rest, repeat—has served us well on a number of occasions, and it served us well this time. It is both more efficient and more relaxing than an evenly spaced journey, especially when

children are involved. In exploration, Stephen Ambrose writes in *Undaunted Courage*, “the planning process . . . is as much guesswork as it is intelligent forecasting of the physical needs of the expedition.” If we were to repeat

our Lewis and Clark expedition, we would make one big adjustment—starting and ending in Bismarck, rather than duplicating the original journey by starting and ending in St. Louis. The stretch between the Mississippi and the Dakotas is just too long, and the time saved can be well spent in other places.

A question about long-distance car travel that often comes up: Should personal stereos be banned, on aesthetic and communitarian grounds? Yes, in your next life. In this life bring one per customer—and a battery recharger.

Ecola Point, Oregon, near Lewis and Clark's winter camp

Grownups will inevitably have more taste and more tolerance than will children for some of the literary aspects of a Lewis and Clark trip. (“Read the journals aloud,” Ambrose had urged—a highly worthwhile activity, but one for which a family in its full complement may have limited patience.) Fortunately, for reasons dictated by geography, much of American history and commerce moved west on the same general route that Lewis and Clark did, which means that plenty of other things to do and see are within easy reach along the way: whitewater rafting, rodeos all during the summer, and kitschy western weird stuff everywhere. Three of the greatest national parks (Glacier, Yellowstone, Grand Teton) and some wonderful smaller ones (Badlands, Theodore Roosevelt) also lie in the neighborhood. We gave each child the right to pick one “must-see” destination, prompting forays to Old Faithful, Mount St. Helens, and the ghost town of Bannack, Montana.

Good books and maps are essential. In addition to the Ambrose account we took with us the one-volume *Journals of Lewis and Clark*, edited by Bernard DeVoto. *Lewis & Clark: The Journey of the Corps of Discovery*, the book based on last fall's PBS documentary, by Dayton Duncan and Ken Burns, is useful for its photographs and its reproductions of paintings and documents. The National Park Service has often been a target of criticism on matters of high national policy, but I have always been impressed with its service-oriented outposts at actual park sites. Even the most rudimenta-

ry Park Service maps for the carbound are clear and elegant; visitor centers and ranger stations usually also stock topographical maps for the more adventurous. One of the best investments we made was in the Forest Service's large-scale map of the Clearwater National Forest, which enfolds the entire Lolo Trail. General inquiries about Lewis and Clark's route should be addressed to the Lewis and Clark National Historic Trail, National Park Service, 700 Rayovac Drive, Suite 100, Madison, WI 53711; 608-264-5610.

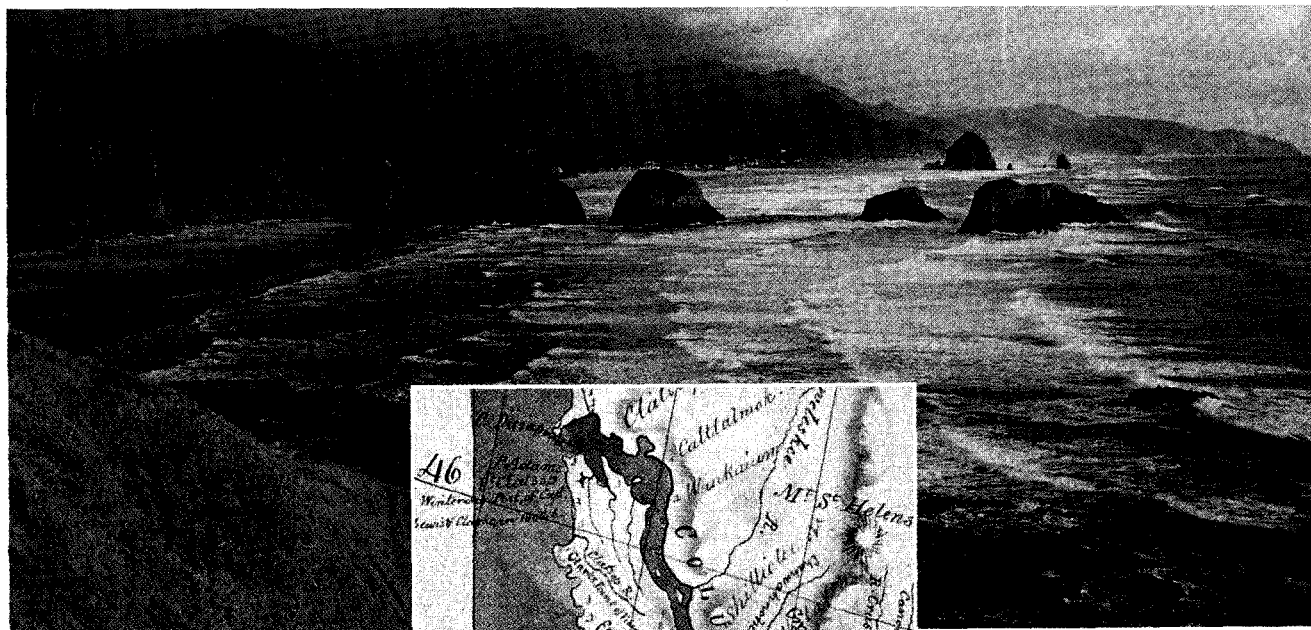
One other map proved indispensable: a map of Powell's City of Books (provided at the door), a sprawling bookstore in Portland, Oregon, with a well-deserved

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*The salt air on
a steady breeze was a
powerful restorative.*

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national reputation for a vast stock and a smart staff. A long display area is devoted to Lewis and Clark materials. In a brilliant stroke, new and secondhand books are shelved together. Thomas Jefferson said nothing in his orders about keeping an eye out for a good bookstore, but if the Corps of Discovery had returned with news of Powell's and nothing else, the expedition should still have been accounted a great success. ☞



TERRY DONNELLY/TONY STONE; MAP DETAIL: BOSTON ATHENAEUM

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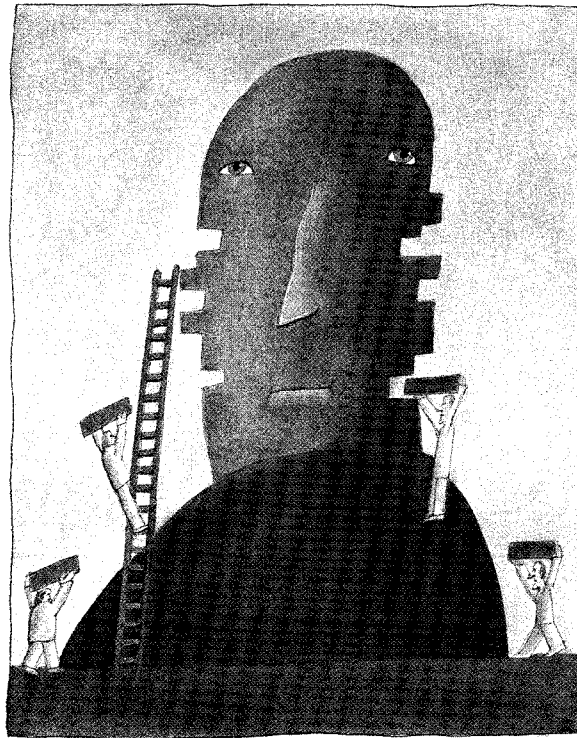
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BACK FROM CHAOS

by EDWARD O. WILSON



Enlightenment thinkers knew a lot about everything, today's specialists know a lot about a little, and postmodernists doubt that we can know anything at all. One of the century's most important scientists argues, against fashion, that we can know what we need to know, and that we will discover underlying all forms of knowledge a fundamental unity

IN contrast to widespread opinion, I believe that the Enlightenment thinkers of the seventeenth and eighteenth centuries got it mostly right. The assumptions they made about a lawful material world, the intrinsic unity of knowledge, and the potential for indefinite human progress are the ones we still take most readily to heart, suffer without, and find maximally rewarding as we learn more and more about the circumstances of our lives. The greatest enterprise of the mind always has been and always will be the attempt to link the sciences and the humanities. The ongoing fragmentation of knowledge and the resulting chaos in philosophy are not reflections of the real world but artifacts of scholarship.

The key to unification is consilience. I prefer this word to "coherence," because its rarity has preserved its precision, whereas "coherence" has several possible meanings. William Whewell, in his 1840 synthesis *The Philosophy of the Inductive Sciences*, was the first to speak of consilience—literally a "jumping together" of knowledge as a result of the linking of facts and fact-based theory across disciplines to create a common groundwork of explanation. He wrote, "The Consilience of Inductions takes place when an Induction, obtained from one class of facts, coincides with an Induction, obtained from another different class. This Consilience is a test of the truth of the Theory in which it occurs."

Consilience can be established or refuted only by methods developed in the natural sciences—in an effort, I hasten to add, not led by scientists, or frozen in mathematical abstraction, but consistent with the habits of thought that have worked so well in exploring the material universe.

The belief in the possibility of consilience beyond science and across the great branches of learning is a metaphysical world view, and a minority one at that, shared by only a few scientists and philosophers. Consilience cannot be proved with logic from first principles or grounded in any definitive set of empirical tests, at least not any yet conceived. Its best support is no more than an extrapolation from the consistent past success of the natural sciences. Its surest test will be its effectiveness in the social sciences and the humanities. The strongest appeal of consilience is in the prospect of intellectual adventure and, if even only modest success is achieved, a better understanding of the human condition.

To illustrate the claim just made, think of two intersecting perpendicular lines, and picture the quadrants thus created. Label one quadrant “environmental policy,” one “ethics,” one “biology,” and one “social science.”

environmental policy	social science
ethics	biology

We already think of these four domains as closely connected, so rational inquiry in one informs reasoning in the other three. Yet each undeniably stands apart in the contemporary academic mind. Each has its own practitioners, language, modes of analysis, and standards of validation. The result is confusion—and confusion was correctly identified by Francis Bacon, four centuries ago, as the direst of errors, which “occurs wherever argument or inference passes from one world of experience to another.”

Next imagine a series of concentric circles around the point of intersection.

environmental policy	social science
ethics	biology

As we cross the circles inward toward the point at which the quadrants meet, we find ourselves in an increasingly unstable and disorienting region. The ring closest to the intersection, where most real-world problems exist, is the one in which fundamental analysis is most needed. Yet virtually no maps exist; few concepts and words serve to guide us. Only

in imagination can we travel clockwise from the recognition of environmental problems and the need for soundly based policy to the selection of solutions based on moral reasoning to the biological foundations of that reasoning to a grasp of social institutions as the products of biology, environment, and history—and thence back to environmental policy.

Consider this example. Governments everywhere are at a loss regarding the best policy for regulating the dwindling forest reserves of the world. Few ethical guidelines have been established from which agreement might be reached, and those are based on an insufficient knowledge of ecology. Even if adequate scientific knowledge were available, we would have little basis for the long-term valuation of forests. The economics of sustainable yield is still a primitive art, and the psychological benefits of natural ecosystems are almost wholly unexplored.

The time has come to achieve the tour of such domains in reality. This is not an idle exercise for the delectation of intellectuals. The ease with which the educated public, not just intellectuals and political leaders, can think around these and similar circuits, starting at any point and moving in any direction, will determine how wisely public policy is chosen.

To ask if consilience can be gained in the domains of the innermost circles, such that sound judgment will flow easily from one discipline to another, is equivalent to asking whether, in the gathering of disciplines, specialists can ever reach agreement on a common body of abstract principles and evidential proof. I think they can. Trust in consilience is the foundation of the natural sciences. For the material world, at least, the momentum is overwhelmingly toward conceptual unity. Disciplinary boundaries within the natural sciences are disappearing, in favor of shifting hybrid disciplines in which consilience is implicit. They reach across many levels of complexity, from chemical physics and physical chemistry to molecular genetics, chemical ecology, and ecological genetics. None of the new specialties is considered more than a focus of research. Each is an industry of fresh ideas and advancing technology.

TERROR AND THE ENLIGHTENMENT

THE dream of intellectual unity was a product of the Enlightenment, an Icarian flight of the mind that spanned the seventeenth and eighteenth centuries. A vision of secular knowledge in the service of human rights and human progress, it was the West’s greatest contribution to civilization. It launched the modern era for the

whole world; we are all its legatees. Then—astonishingly—it failed.

Given the prospect of renewed convergence of the disciplines, it is of surpassing importance to understand both the essential nature of the Enlightenment and the weaknesses that brought it down. Both can be said to have been embodied in the life of the Marquis de Condorcet. No single event better marks the end of the Enlightenment than his death, on March 29, 1794. The circumstances were exquisitely ironic. Condorcet has been called the prophet of the Laws of Progress. By virtue of his towering intellect and visionary political leadership, he seemed destined to emerge from the French Revolution as the Jefferson of France. But in late 1793 and early 1794, as he was composing the ultimate Enlightenment blueprint, *Sketch for a Historical Picture of the Progress of the Human Mind*, he was instead a fugitive from the law, liable to a sentence of death by representatives of the cause he had so faithfully served. His crime was political: He was perceived to be a Girondist, a member of a faction found too moderate—too reasonable—by the radical Jacobins. Worse, he had criticized the constitution drawn up by the Jacobin-dominated National Convention. He died on the floor of a cell in the jail at Bourg-la-Reine, after being imprisoned by villagers who had captured him on the run. They would certainly have turned him over to the Paris authorities for trial. The cause of death is unknown. Suicide was ruled out at the time, but poison, which he carried with him, is nevertheless a possibility; so is trauma or heart attack. At least he was spared the guillotine.

The French Revolution drew its intellectual strength from men and women like Condorcet. It was readied by the growth of educational opportunity and then fired by the idea of the universal rights of man. Yet as the Enlightenment seemed about to achieve political fruition in Europe, something went terribly wrong. What seemed at first to be minor inconsistencies widened into catastrophic failures. Thirty years earlier Jean-Jacques Rousseau, in *The Social Contract*, had introduced the idea that was later to inspire the rallying slogan of the Revolution: “Liberty, Equality, Fraternity.” But he had also invented the fateful abstraction of the “general will” to achieve these goals. The general will, he wrote, is the rule of justice agreed upon by assemblies of free people whose interest is only to serve the welfare of the society and of each person in it. When achieved, it forms a sovereign contract that is “always constant, unalterable, and pure.” “Each of us puts his person and all his power in common under the supreme direction of the general will, and, in our corporate capacity, we receive each member as an indivisible part of the whole.” Those who do not conform to the general will, Rousseau continued, are deviants subject to necessary force by the assembly. A truly egalitarian democracy cannot be achieved in any other way.

Robespierre, who led the Reign of Terror that overtook

the Revolution in 1793, grasped this logic all too well. He and his fellow Jacobins understood Rousseau’s necessary force to include summary condemnations and executions of all those who opposed the new order. Some 300,000 nobles, priests, political dissidents, and other troublemakers were imprisoned, and 17,000 died within the year. In Robespierre’s universe the goals of the Jacobins were noble and pure. They were, as he serenely wrote in February of 1794 (shortly before he himself was guillotined), “the peaceful enjoyment of liberty and equality, the rule of that eternal justice whose laws have been engraved . . . upon the hearts of men, even upon the heart of the slave who knows them not and of the tyrant who denies them.”

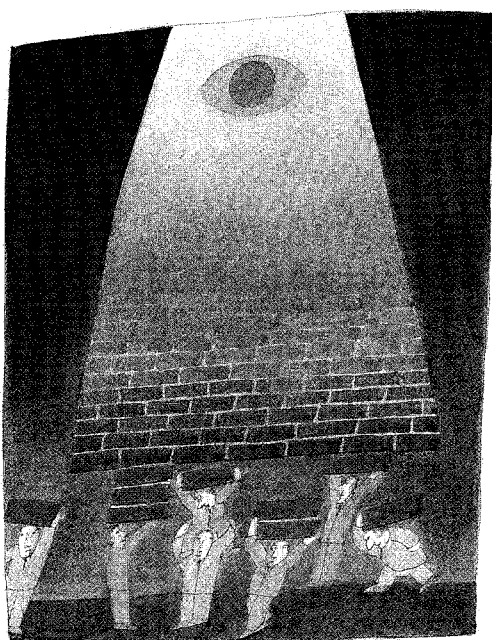
Thus took form the easy cohabitation of egalitarian ideology and savage coercion that was to plague the next two centuries. The decline of the Enlightenment was hastened not just by tyrants who used it for justification but by rising and often valid intellectual opposition. Its dream of a world made orderly and fulfilling by free intellect had seemed at first indestructible, the instinctive goal of all men. The movement gave rise to the modern intellectual tradition of the West and much of its culture. Its creators, among the greatest scholars since Plato and Aristotle, showed what the human mind can accomplish. Isaiah Berlin, one of their most perceptive historians, praised them justly as follows: “The intellectual power, honesty, lucidity, courage, and disinterested love of the truth of the most gifted thinkers of the eighteenth century remain to this day without parallel. Their age is one of the best and most hopeful episodes in the life of mankind.” But they reached too far, and their best efforts were not enough to create the sustained endeavor their vision foretold.

*In this winter of our cultural discontent,
can the spirit of the Enlightenment be regained?*



THE PERIL OF PERFECTIBILITY

THIS, then, was the problem. Although reason supposedly was the defining trait of the human species, and needed only a little more cultivation to flower universally, it fell short. Humanity was not paying attention. Humanity thought otherwise. The causes of the Enlightenment's decline, which persist today, illuminate the labyrinthine wellsprings of human motivation. It is worth asking, particularly in this winter of our cultural discontent, whether the original spirit of the Enlightenment—confidence, optimism, eyes to the horizon—can be regained. And to ask in honest opposition, *Should* it be regained, or did it possess in its first conception, as some have suggested, a dark-angelic flaw? Might its idealism have contributed to the Terror, which



Bacon's pyramid of disciplines had metaphysics at the peak.

foreshadowed the horrendous dream of the totalitarian state? If knowledge can be consolidated, so might the "perfect" society be designed—one culture, one science—whether fascist, communist, or theocratic.

The Enlightenment itself, however, was never a unified movement. It was less a determined, swift river than a lace-work of deltaic streams working their way along twisted channels. By the time of the French Revolution it was very old. It emerged from the Scientific Revolution during the early seventeenth century and attained its greatest influence in the European academy during the eighteenth. Its originators often clashed over fundamental issues. Most engaged from time to time in absurd digressions and speculations, such as looking for hidden codes in the Bible and for the anatomical seat of the

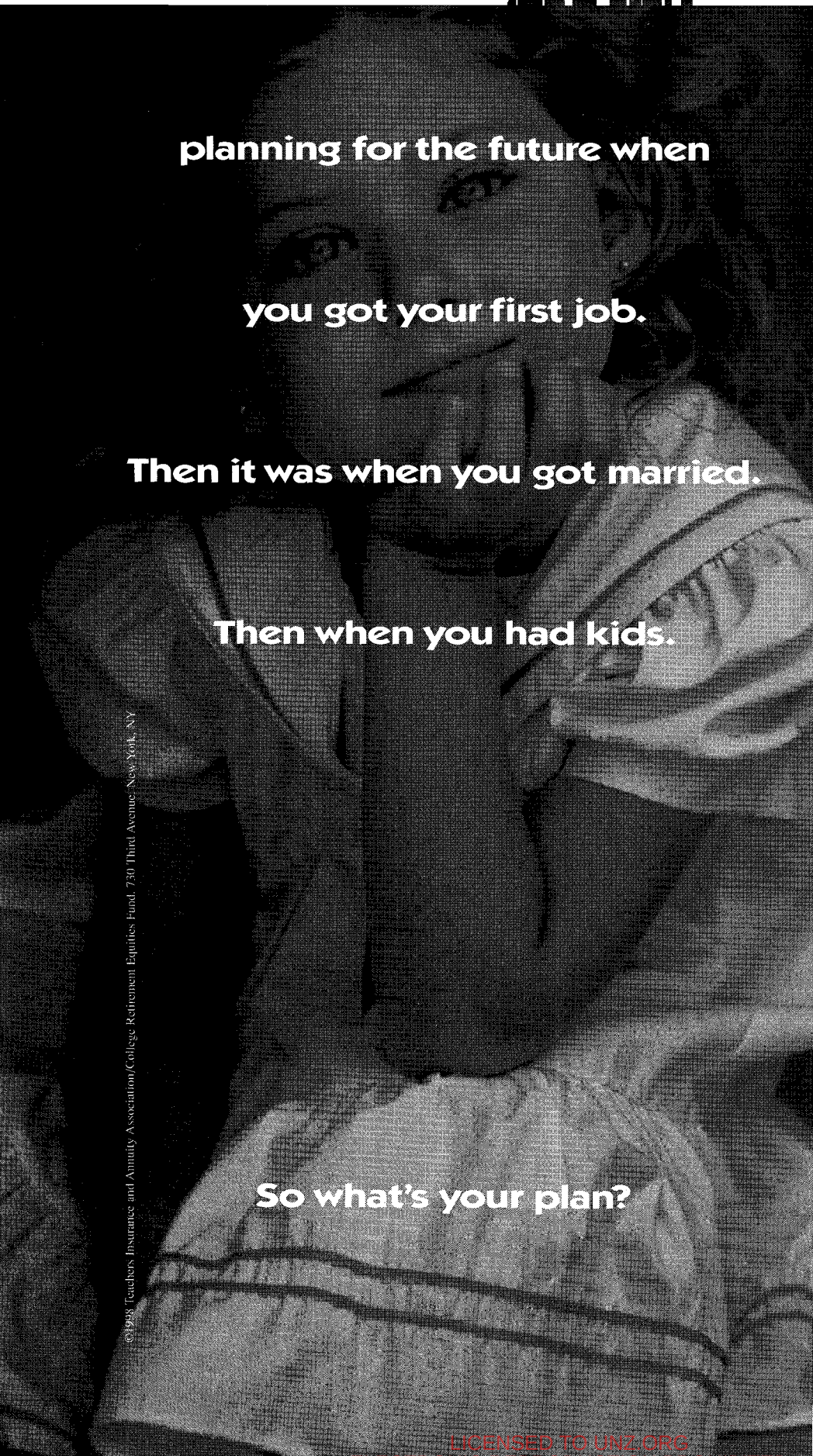
soul. The overlap of their opinions was nevertheless extensive and clear and well reasoned enough to bear this simple characterization: They shared a passion to demystify the world and free the mind from the impersonal forces that imprison it.

They were driven by the thrill of discovery. They agreed on the power of science to reveal an orderly, understandable universe and thereby lay an enduring base for free rational discourse. They thought that the perfection of the celestial bodies discovered by astronomy and physics could serve as a model for human society. They believed in the unity of all knowledge, individual human rights, natural law, and indefinite human progress. They tried to avoid metaphysics even as the flaws in and incompleteness of their explanations forced them to practice it. They resisted organized religion. They despised revelation and dogma. They endorsed, or at least tolerated, the state as a contrivance required for civil order. They believed that education and right reason would enormously benefit humanity. A few, like Condorcet, thought that human beings were perfectible and capable of shaping and administering a political utopia.

FRANCIS BACON AND GOD'S MACHINE

SCIENCE was the engine of the Enlightenment. The more scientifically disposed Enlightenment authors agreed that the cosmos is an orderly material construct governed by exact laws. It can be broken down into entities that can be measured and arranged in hierarchies, such as societies, which are made up of persons, whose brains consist of nerves, which in turn are composed of atoms. In principle, at least, the atoms can be reassembled into nerves, the nerves into brains, and the persons into societies, with the whole understood as a system of mechanisms and forces. If one insists on a divine intervention, the Enlightenment philosophers maintained, one should think of the world as God's machine. The conceptual constraints that cloud our vision of the physical world can be eased for the betterment of humanity in every sphere. Thus Condorcet, in an era still unburdened by the ballast of complicating fact, called for the illumination of the moral and political sciences by the "torch of analysis."

The grand architect of this dream was not Condorcet, or any of the other *philosophes* who expressed it so well, but Francis Bacon. Among the Enlightenment founders, he is the one who most endures in spirit, informing us across four centuries that we must understand nature, both around us and within ourselves, in order to set humanity on the course of self-improvement. We must do it knowing that our destiny is in our own hands and that denial of the dream will lead back to barbarism. In his scholarship Bacon questioned the solidity of classical "delicate" learning—those medieval forms based on ancient texts and logical expatiation. He spurned reliance on ordinary scholastic philosophy, calling for a study of nature and the hu-



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man condition on their own terms and without artifice. He observed that because "the mind, hastily and without choice, imbibes and treasures up the first notices of things, from whence all the rest proceed, errors must forever prevail, and remain uncorrected." Thus knowledge is not well constructed but "resembles a magnificent structure that has no foundation."

By reflecting on all possible methods of investigation available to his imagination, Bacon concluded that the best

among them for accurate thought was induction—the gathering of large numbers of facts and the detection of patterns. In order to obtain maximum objectivity, we must entertain only a minimum of preconceptions. Bacon proclaimed a pyramid of disciplines, with natural history forming the base, physics above and subsuming it, and metaphysics at the peak, explaining everything below—though perhaps in powers and forms beyond the grasp of man.



He was neither a gifted scientist ("I can not thridd needles so well") nor trained in mathematics, but he was a brilliant thinker, who founded the philosophy of science. A Renaissance man, he took, in his famous phrase, all knowledge to be his province. Then he stepped forward into the Enlightenment as the first taxonomist and master purveyor of the scientific method.

Bacon defined science broadly to include a foreshadow-

ing of the social sciences and parts of the humanities. The repeated testing of knowledge by experiment, he insisted, is the cutting edge of learning. But to him "experiment" meant more than controlled manipulations in the manner of modern science. It was all the ways in which humanity brings change into the world through information, agriculture, and industry. He believed the great branches of learning to be open-ended and constantly evolving, but he nonetheless

wrote eloquently on his belief in the underlying unity of knowledge. He rejected the sharp divisions among the disciplines that had prevailed since Aristotle.

Bacon elaborated on but did not invent the method of induction as a counterpoint to classical and medieval deduction. Still, he deserves the title Father of Induction, on which much of his fame rested in later centuries. The procedure he favored was much more than merely making factual generalizations—such as, to use a modern example, “Ninety percent of plant species have flowers that are yellow, red, or white, and are visited by insects.” Rather, he said, *start* with such an unbiased description of phenomena. Collect their common traits into an intermediate level of generality. Then proceed to higher levels of generality—such as, “Flowers have evolved colors and anatomy designed to attract certain kinds of insects, and these are the creatures that exclusively pollinate them.” Bacon’s reasoning was an improvement over the traditional methods of description and classification prevailing during the Renaissance, but it anticipated little of the methods of concept formation, competing hypotheses, and theory that form the core of modern science.

In psychology, and particularly in the nature of creativity, Bacon cast his vision furthest ahead. Although he did not use the word (it was not coined until 1653), he understood the critical importance of psychology in scientific research and all other forms of scholarship. He had a deep intuition for the mental processes of discovery. He understood the means by which those processes are best systematized and most persuasively transmitted. “The human understanding,” he wrote, “is no dry light, but receives an infusion from the will and affections; whence proceed sciences which may be called ‘sciences as one would.’” He did not mean by this to distort perception of the real world by interposing a prism of emotion. Reality ought still to be embraced directly and reported without flinching. But it is also best delivered the same way it was discovered, retaining a comparable vividness and play of the emotions.

I do not wish, by ranking Francis Bacon so high, to portray him as a thoroughly modern man. He was far from that. His friend William Harvey, a

physician and a real scientist who made a fundamental discovery, the circulation of the blood, noted drily that Bacon wrote philosophy like a Lord Chancellor. His phrases make splendid marble inscriptions and commencement flourishes. The unity of knowledge he conceived is remote from the present-day concept of consilience, far from the deliberate, systematic linkage of cause and effect across the disciplines. His stress lay instead on the common means of inductive in-

quiry that might optimally serve all the branches of learning. He searched for the techniques that best convey the knowledge gained, and to that end he argued for the full employment of the humanities, including art and fiction, as the best means for developing and expressing science. Science, as he broadly defined it, should be poetry, and poetry science. That, at least, has a pleasingly modern ring.

Bacon’s philosophy raised the sights of a small but influential public. It helped to prime the Scientific Revolution, which was to blossom spectacularly in the decades ahead. To this day his vision remains at the heart of the scientific-technological ethic. He was a magnificent figure, standing alone by necessity of circumstance, who achieved that affecting combination of humility and innocent arrogance present only in the greatest scholars.

DESCARTES AND THE THREE COORDINATES

ALL histories that live in our hearts are peopled by archetypes in mythic narratives. This, I believe, is part of Francis Bacon’s appeal and the reason that his fame endures. In the tableau of the Enlightenment, Bacon is the herald of adventure. A new world is waiting, he announced; let us begin the long and difficult march into its unmapped terrain. René Descartes, the founder of algebraic geometry and modern philosophy, and France’s pre-eminent scholar of all time, is the mentor in the narrative. Like Bacon before him, he summoned scholars to the scientific enterprise; among them came the young Isaac Newton. Descartes showed how to do science with the aid of precise deduction, cutting to the quick of each phenomenon and skeletonizing it. The world is three-dimensional, he explained, so let our perception of it be framed in three coordinates. Today they are called Cartesian coordinates.

With them the length, breadth, and height of any object can be exactly specified and subjected to mathematical operations to explore the object’s essential qualities. Descartes accomplished this step in elementary form by reformulating algebraic notation so that it could

be used to solve complex problems of geometry and, further, to explore realms of mathematics beyond the visual realm of three-dimensional space.

Descartes’s overarching vision was of knowledge as a system of interconnected truths that can ultimately be abstracted into mathematics. It all came to him, he said, through a series of dreams in November of 1619, when somehow, in a flurry of symbols (thunderclaps, books, an evil spirit, a de-

**FRANCIS BACON WAS A MAGNIFICENT
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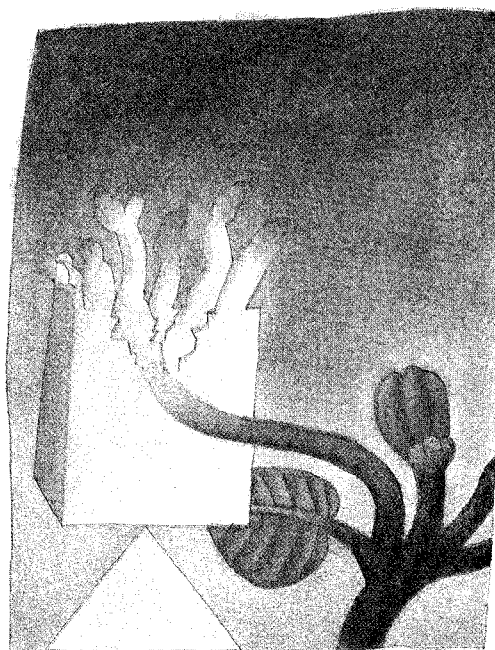
licious melon), he perceived that the universe is both rational and united throughout by cause and effect. He believed that this conception could be applied everywhere from physics to medicine—hence biology—and even to moral reasoning. In this respect he laid the groundwork for the belief in the unity of learning that was to influence Enlightenment thought profoundly in the eighteenth century.

Descartes insisted that systematic doubt was the first principle of learning. By his light, all knowledge was to be laid out and tested on the iron frame of logic. He allowed himself only one undeniable premise, captured in the celebrated phrase "*Cogito ergo sum*"—"I think, therefore I am." The system of Cartesian doubt, which still thrives in modern science, is one in which all assumptions that can be are systematically eliminated, so as to leave only one set of axioms on which rational thought can be based and experiments can be rigorously designed.

Descartes nonetheless made a fundamental concession to metaphysics. A lifelong Catholic, he believed in God as a perfect being, manifested by the power of the idea of such a being in his own mind. That given, he went on to argue for the complete separation of mind and matter. The stratagem freed him to put spirit aside and concentrate on matter as pure mechanism. In works published over the years 1637–1649 Descartes introduced reductionism, the study of the world as an assemblage of physical parts that can be broken down and analyzed separately. Reductionism and analytic mathematical modeling were destined to become the most powerful intellectual instruments of modern science. (The year 1642 was a signal one in the history of ideas: with Descartes's *Meditationes de Prima Philosophia* just published and his *Principia Philosophiae* soon to follow, Galileo died and Newton was born.)

As Enlightenment history unfolded, Isaac Newton came to rank with Galileo as the most influential of the heroes who answered Bacon's call. A restless seeker of horizons, stunningly resourceful, he invented calculus before Gottfried Leibniz, whose notation was nevertheless clearer and is the one used today. In company with analytic geometry, calculus proved to be one of the two crucial mathematical techniques in physics and, later, chemistry, biology, and economics.

In 1684 Newton formulated the mass and distance laws of gravity, and in 1687 the three laws of motion. With these mathematical formulations he achieved the first great breakthrough in modern science. He showed that the planetary orbits postulated by Copernicus and proved elliptical by Kepler could be predicted from the first principles of mechanics. His laws were exact and equally applicable to all inanimate matter, from the solar system down to grains of sand—and, of course, to the falling apple that had triggered his thinking on the subject twenty years previously (apparently a true story). The universe, he said, is not just orderly but also intelligible. At least part of God's grand design could be written with a few lines on a piece of paper.



*Science should be poetry,
and poetry science.*

The laws of gravity and motion were a powerful beginning. And they started Enlightenment scholars thinking. Why not a Newtonian solution to the affairs of men? The idea grew into one of the mainstays of the Enlightenment agenda. As late as 1835 Adolphe Quételet was proposing "social physics" as the basis of the discipline soon to be named sociology. Auguste Comte, his contemporary, believed a true social science to be inevitable. "Men," he said, echoing Condorcet, "are not allowed to think freely about chemistry and biology, so why should they be allowed to think freely about political philosophy?" People, after all, are just extremely complicated machines. Why shouldn't their behavior and social institutions conform to certain still-undefined natural laws?

Given its unbroken string of successes during the next three centuries, reductionism may seem today the obvious best way to have constructed knowledge of the physical world, but it was not so easy to grasp at the dawn of science. Western science took the lead in the world largely because it cultivated reductionism and physical law to expand the understanding of space and time beyond that attainable by the unaided senses. The advance, however, carried humanity's self-image ever further from its perception of the remainder of the universe, and as a consequence the full reality of the universe seemed to grow progressively more alien. The ruling talismans of twentieth-century science, relativity and quantum mechanics, have become the ultimate in strangeness to the human mind. They were conceived by Albert Einstein, Max Planck, and other pioneers of theoretical physics during a search for quantifiable truths that would be known to extraterrestrials as well as to our species, and hence certifiably independent of the human mind. The physicists succeeded magnificently, but in so doing

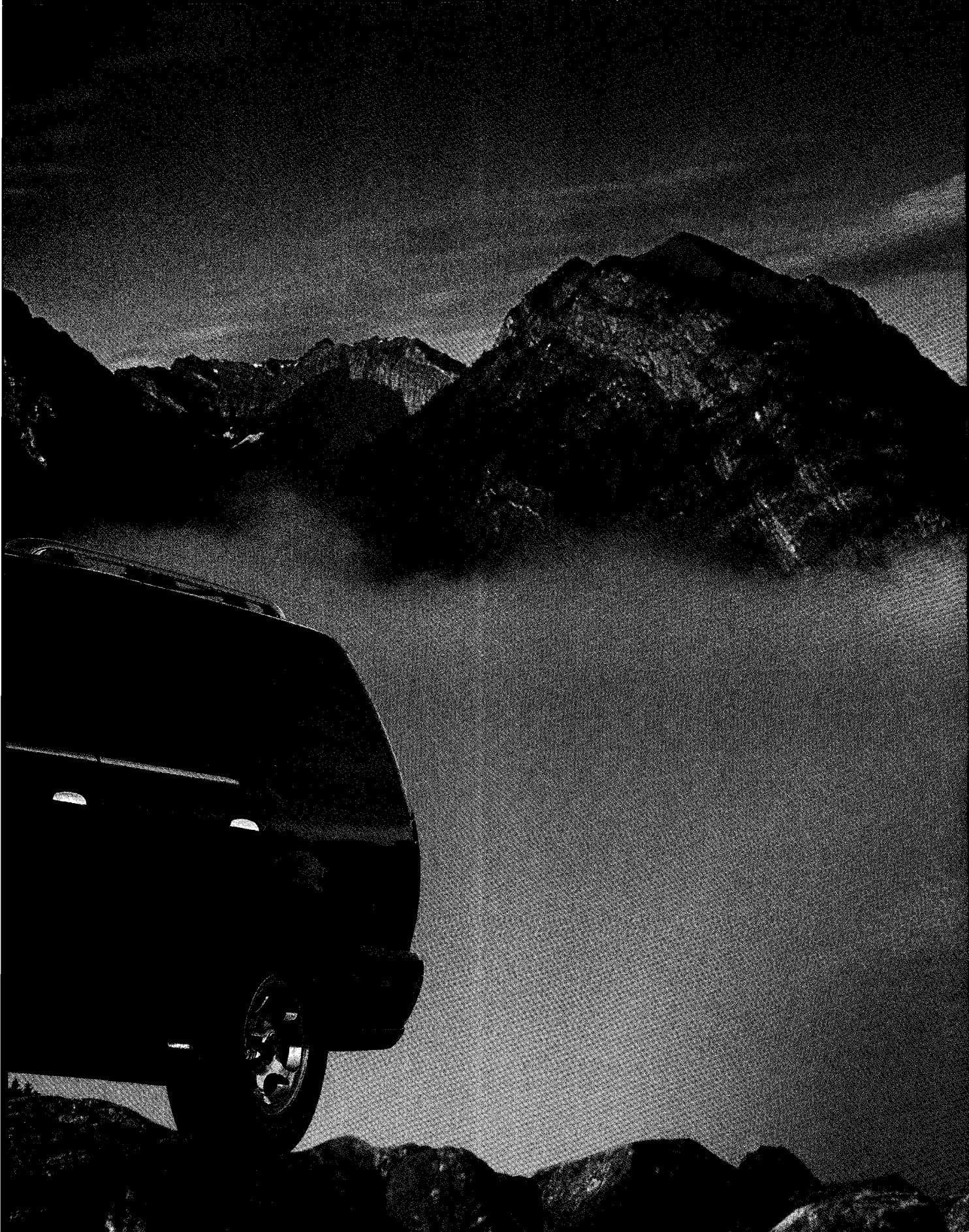
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they revealed the limitations of intuition unaided by mathematics; an understanding of nature, they discovered, comes very hard. Theoretical physics and molecular biology are acquired tastes. The cost of scientific advance is the humbling recognition that reality was not constructed to be easily grasped by the human mind. This is the cardinal tenet of scientific understanding: Our species and its ways of thinking are a product of evolution, not the purpose of evolution.

THE CASE FOR DEISM

WE now pass to the final archetype of the epic tableau, the keepers of the innermost room. The more radical Enlightenment writers, alert to the implications of scientific materialism, moved to reassess God himself. They imagined a Creator obedient to his own natural laws—the belief known as deism. They disputed the theism of Judeo-Christianity, whose divinity is both omnipotent and personally interested in human beings, and they rejected the nonmaterial worlds of heaven and hell. At the same time, few dared go the whole route and embrace atheism, which seemed to imply cosmic meaninglessness and risked outraging the pious. So by and large they took a middle position. God the Creator exists, they conceded, but He is allowed only the entities and processes manifest in his own handiwork.

Deistic belief, by persisting in attenuated form to this day, has given scientists a license to search for God. More precisely, it has prompted a small number to make a partial sketch of Him (Her? It? Them?), derived from their professional meditations.

Few scientists and philosophers, however, let alone religious thinkers, take scientific theology very seriously. A

more coherent and interesting approach, possibly within the reach of theoretical physics, is to try to answer the following question: Is a universe of discrete material particles possible only with one specific set of natural laws and parameter values? In other words, does the human imagination, which can conceive of other laws and values, thereby exceed possible existence? Any act of Creation may be only a subset of the universes we can imagine. On this point Einstein is said to have remarked to his assistant Ernst Straus, in a moment of neo-deistic reflection, “What really interests me is whether God had any choice in the creation of the world.” That line of reasoning can be extended rather mystically to formulate the “anthropic principle,” which asserts that the laws of nature, in *our* universe at least, had to be set a certain precise way so as to allow the creation of beings able to ask about the laws of nature. Did Someone decide to do it that way?

The dispute between Enlightenment deism and theology can be summarized as follows. The traditional theism of Christianity is rooted in both reason and revelation, the two conceivable sources of knowledge. According to this view, reason and revelation cannot be in conflict, because in areas of opposition, revelation is given the higher role—as the Inquisition reminded Galileo in Rome when he was offered a choice between orthodoxy and pain. In contrast, deism grants reason the edge, and insists that theists justify revelation with the use of reason.

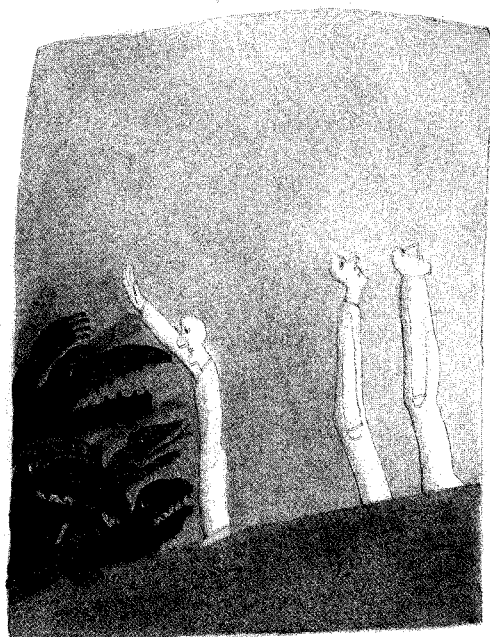
Traditional theologians of the eighteenth century, faced with the Enlightenment challenge, refused to yield an inch of ground. Christian faith, they argued, cannot submit itself to the debasing test of rationality. Deep truths exist that are beyond the grasp of the unaided human mind, and God will reveal them to our understanding when and by whatever means He chooses.

Given the centrality of religion in everyday life, the stand of the theists against reason seemed . . . well, reasonable. Eighteenth-century believers saw no difficulty in conducting their lives by both ratiocination and revelation. The theologians won the argument simply because they saw no compelling reason to adopt a new metaphysics. For the first time, the Enlightenment visibly stumbled.

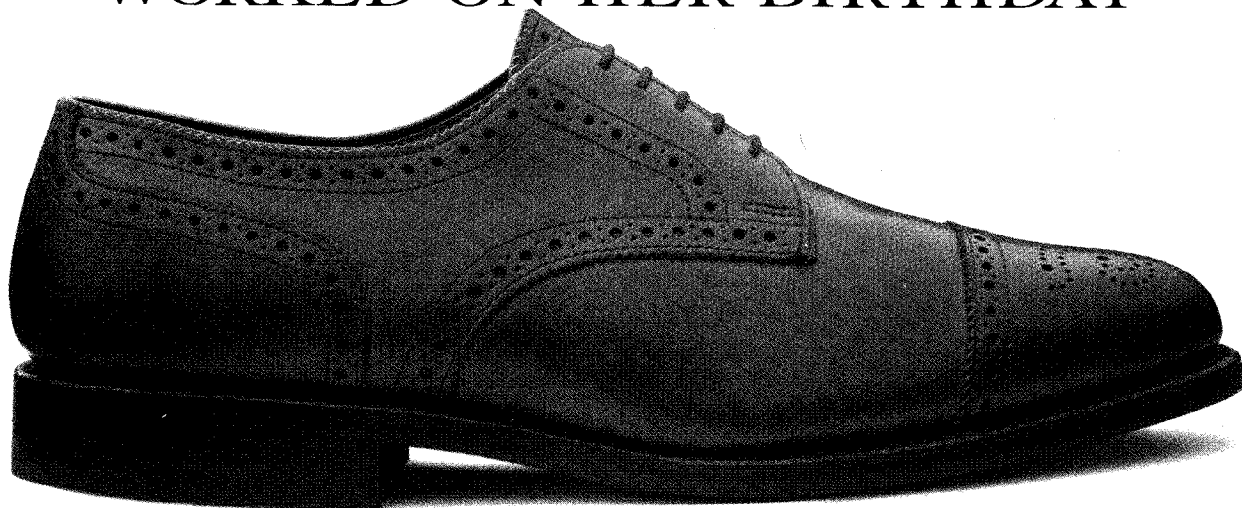
The fatal flaw in deism is thus not rational at all but emotional. Pure reason is unappealing because it is bloodless. Ceremonies stripped of sacred mystery lose their emotional force, because celebrants need to defer to a higher power in order to consummate their instinct for tribal loyalty. In times of danger and tragedy especially, unreasoning ceremony is everything. Rationalism provides no substitute for surrender to an infallible and benevolent being, or for the leap of faith called transcendence. Most people, one imagines, would very much like science to prove the existence of God but not to take the measure of his capacity.

Deism and science also failed to systematize ethics. The Enlightenment promise of an objective basis for moral reasoning could not be kept. If an immutable secular field of

*The dark side of the Enlightenment:
the barbarians of totalitarianism pour in.*



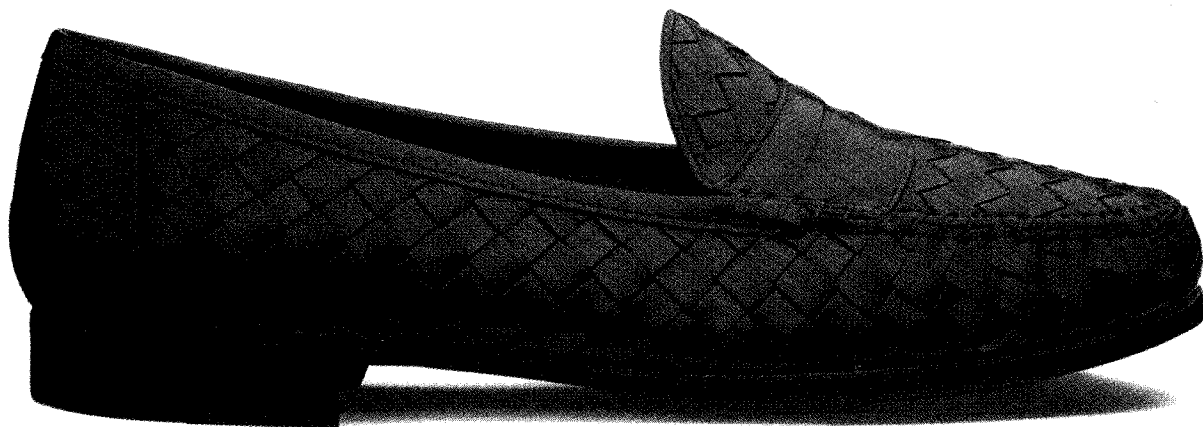
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ethical premises exists, the human intellect during the Enlightenment seemed too weak and shifting to locate it. So theologians and philosophers stuck to their original positions, either by deferring to religious authority or by articulating subjectively perceived natural rights. No logical alternative seemed open to them. The millennium-old rules sacralized by religion seemed to work, more or less. One can defer reflection on the celestial spheres indefinitely, but daily matters of life and death require moral decisiveness.

HOW SELF-KNOWLEDGE LEADS TO TOTALITARIANISM

ANOTHER, more purely rationalist objection to the Enlightenment program remains. Grant for argument's sake that the most extravagant claims of the Enlightenment's supporters proved true and scientists could look into the future to see what course of action was best for humanity. Wouldn't that trap us in a cage of logic and revealed fate? The thrust of the Enlightenment, like the Greek humanism that prefigured it, was Promethean: the knowledge it generated was to liberate mankind by lifting it above the savage world. But the opposite might occur: if scientific inquiry diminishes the conception of divinity while prescribing immutable natural laws, then humanity can lose what freedom it already possesses. Perhaps only one social order is "perfect" and scientists will find it—or, worse, falsely claim to have found it. Religious authority, the Hadrian's Wall of civilization, will be breached, and the barbarians of totalitarian ideology will pour in. Such is the dark side of Enlightenment secular thought, unveiled in the French Revolution and expressed more recently by theories of "scientific" socialism and racist fascism.

Still another concern is that a science-driven society risks upsetting the natural order of the world set in place by God, or by billions of years of evolution. Science given too much authority risks conversion into a self-destroying impiety. The godless creations of science and technology are in fact powerful and arresting images of modern culture. Frankenstein's monster and Hollywood's Terminator (an all-metal, microchip-guided Frankenstein's monster) wreak destruction on their creators, including the naive geniuses in lab coats who arrogantly forecast a new age ruled by science. Storms rage, hostile mutants spread, life dies. Nations menace one another with world-destroying technology. Even Winston Churchill, whose country was saved by radar, worried after the atom-bombing of Japan that the Stone Age might return "on the gleaming wings of Science."

THE RISE OF ROMANTICISM

FOR those who thus feared science as Faustian rather than Promethean, the Enlightenment program posed a grave threat to spiritual freedom—even to life itself. What is the answer to such a threat? Revolt! Return to natural man, reassert the primacy of individual imagination and confidence in immortality. Find an escape to a higher realm through art; promote a Romantic revolution. In 1807 William Wordsworth, in words typical of the movement then spreading over Europe, evoked the aura of a primal and serene existence beyond reason's grasp.

Our Souls have sight of that immortal sea
Which brought us hither,
Can in a moment travel thither,
And see the Children sport upon the shore,
And hear the mighty waters rolling evermore.

With Wordsworth's "breathings for incommunicable powers" the eyes close, the mind soars, the inverse square distance law of gravity falls away. The spirit enters another reality, beyond the reach of weight and measure. If the constraining universe of matter and energy cannot be denied, at least it can be ignored with splendid contempt. Beyond question, Wordsworth and his fellow English Romantic poets of the first half of the nineteenth century conjured works of great beauty. They spoke truths in another tongue, and guided the arts still further from the sciences.

Romanticism also flowered in philosophy, where it placed a premium on rebellion, spontaneity, intense emotion, and heroic vision. Searching for aspirations available only to the heart, its practitioners dreamed of mankind as part of boundless nature. Rousseau, although often listed as an Enlightenment *philosophe*, was actually the founder and most extreme visionary of the Romantic philosophical movement. To him,

learning and social order were the enemies of humanity. In works from 1750 (*Discourse on the Sciences and the Arts*) to 1762 (*Emile*) he extolled the "sleep of reason." His utopia is a minimalist state in which people abandon books and other accouterments

**THERE HAVE ALWAYS BEEN TWO KINDS OF
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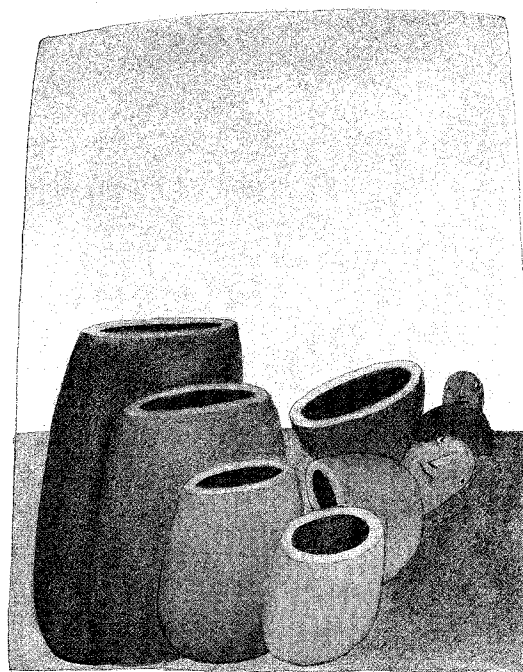
of intellect in order to cultivate good health and enjoyment of the senses. Humanity, Rousseau claimed, was originally a race of noble savages in a peaceful state of nature, and was later corrupted by civilization—and by scholarship. Religion, marriage, law, and government are deceptions created by the powerful for their own selfish ends. The price paid by the common man for this high-level chicanery is vice and unhappiness.

Where Rousseau invented a stunningly inaccurate form of anthropology, the German Romantics, led by Goethe, Hegel, Herder, and Schelling, set out to reinsert metaphysics into science and philosophy. The product, *Naturphilosophie*, was a hybrid of sentiment, mysticism, and quasi-scientific hypothesis. Johann Wolfgang von Goethe, pre-eminent among its expositors, wanted most of all to be a great scientist. He placed that ambition above literature, to which he became an immortal contributor. His respect for science as an idea, an approach to tangible reality, was unreserved, and he understood its basic tenets. Analysis and synthesis, he liked to say, should alternate as naturally as breathing in and breathing out. At the same time, he was critical of the mathematical abstractions of Newtonian science, thinking physics far too ambitious in its goal of explaining the universe.

Goethe can easily be forgiven. After all, he had a noble purpose—nothing less than the coupling of the soul of the humanities to the engine of science. He would have grieved had he foreseen history's verdict: great poet, poor scientist. He failed in his synthesis through lack of what is today called the scientist's instinct—not to mention the necessary technical skills. Calculus baffled him, and some said he could not tell a lark from a sparrow. But he loved nature in a profoundly spiritual way. One must cultivate a close, deep feeling for Nature, he proclaimed. "She loves illusion. She shrouds man in mist, and she spurs him toward the light. Those who will not partake of her illusions she punishes as a tyrant would punish. Those who accept her illusions she presses to her heart. To love her is the only way to approach her." In the philosophers' empyrean, I imagine, Bacon has long since lectured Goethe on the idols of the mind. Newton will have lost patience immediately.

Friedrich Schelling, the leading philosopher of the German Romantics, attempted to immobilize the scientific Prometheus not with poetry but with reason. He proposed a cosmic unity of all things, beyond the understanding of man. Facts by themselves can never be more than partial truths. Those we perceive are only fragments of the universal flux. Nature, Schelling concluded, is alive—a creative spirit that unites knower and known, progressing through greater and greater understanding and feeling toward an eventual state of complete self-realization.

In America, German philosophical Romanticism was mirrored in New England Transcendentalism, whose most celebrated adherents were Ralph Waldo Emerson and Henry David Thoreau. The Transcendentalists were radical individualists who rejected the overwhelmingly commercial nature of American society that came to prevail during the Jacksonian era. They envisioned a spiritual universe built entirely within their personal ethos. They were nevertheless more congenial to science than their European counterparts—witness the many accurate natural-history observations in *Faith in a Seed* and other writings by Thoreau.



Postmodernists believe that one can discern no "real" reality.

THE AGE OF NARROW SPECIALIZATION DAWNS

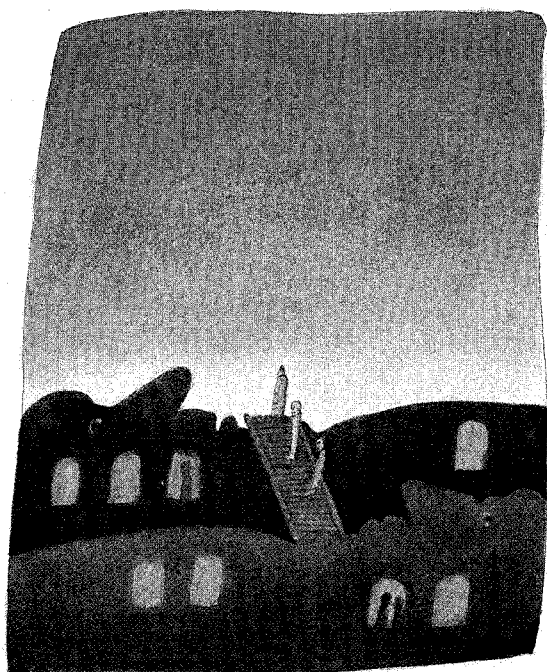
NATURAL scientists, chastened by such robust objections to the Enlightenment agenda, mostly abandoned the examination of human mental life, yielding to philosophers and poets another century of free play. In fact, the concession proved to be a healthy decision for the profession of science, because it steered researchers away from the pitfalls of metaphysics. Throughout the nineteenth century knowledge in the physical and biological sciences grew at an exponential rate. At the same time, newly risen like upstart duchies and earldoms, the social sciences—sociology, anthropology, economics, and political theory—vied for territory in the space created between the hard sciences and the humanities. The great branches of learning emerged in their present form—natural sciences, social sciences, and the humanities—out of the unified Enlightenment vision.

The Enlightenment, defiantly secular in orientation while indebted and attentive to theology, had brought the Western mind to the threshold of a new freedom. It waved aside everything, every form of religious and civil authority, every imaginable fear, to give precedence to the ethic of free inquiry. It pictured a universe in which humanity plays the role of perpetual adventurer. For two centuries God seemed to speak in a new voice to humankind.

By the early 1800s, however, the splendid image was fading. Reason fractured, intellectuals lost faith in the leadership of science, and the prospects for a unity of knowledge sharply declined. The spirit of the Enlightenment lived on in political idealism and the hopes of individual thinkers. In the

ensuing decades new schools sprang up like shoots from the base of a shattered tree: the utilitarian ethics of Bentham and Mill, the historical materialism of Marx and Engels, the pragmatism of Charles Peirce, William James, and John Dewey. But the core agenda seemed irretrievably abandoned. The grand conception that had riveted thinkers during the previous two centuries lost most of its credibility.

Science traveled on its own way. It continued to double every fifteen years in practitioners, discoveries, and technical journals, as it had since the early 1700s, finally starting to level off only around 1970. Its continuously escalating success began to give credence again to the idea of an ordered, explainable universe. This essential Enlightenment premise gained ground in the disciplines of mathematics, physics, and biology, where it had first been conceived by Bacon and Descartes. Yet the enormous success of reductionism, its key method, worked perversely against any recovery of the En-



*The humanities will draw closer
to and partly fuse with the sciences.*

lightenment program as a whole. Precisely because scientific information was increasing at a geometric pace, most researchers thought little about unification, and even less about philosophy. They thought, What works, works. They were still slower to address the taboo-laden physical basis for the workings of the mind, a concept hailed in the late 1700s as the gateway from biology to the social sciences.

There was another, humbler reason for the lack of interest in the big picture: scientists simply didn't have the requisite intellectual energy. The vast majority of scientists have never been more than journeymen prospectors. That is truer than ever today. They are professionally focused; their education

does not open them to the wide contours of the world. They acquire the training they need to travel to the frontier and make discoveries of their own—and make them as fast as possible, because life at the edge is expensive and chancy. The most productive scientists, installed in million-dollar laboratories, have no time to think about the big picture, and see little profit in it. The rosette of the U.S. National Academy of Sciences, which the 2,100 elected members wear on their lapels as a mark of achievement, contains a center of scientific gold surrounded by the purple of natural philosophy. The eyes of most leading scientists, alas, are fixed on the gold.

We should not be surprised, therefore, to find physicists who do not know what a gene is, and biologists who guess that string theory has something to do with violins. Grants and honors are given in science for discoveries, not for scholarship and wisdom. And so it has ever been. Francis Bacon, using the political skills that lofted him to the Lord Chancellorship, personally importuned the English monarchs for funds to carry forth his great scheme of unifying knowledge. He never got a penny. At the height of his fame Descartes was ceremoniously awarded a stipend by the French court. But the account remained unfunded, helping to drive him to the more generous Swedish court, in the "land of bears between rock and ice," where he soon died of pneumonia.

The same professional atomization afflicts the social sciences and the humanities. The faculties of higher education around the world are a congeries of experts. To be an original scholar is to be a highly specialized world authority in a polyglot Calcutta of similarly focused world authorities. In 1797, when Jefferson took the president's chair at the American Philosophical Society, all American scientists of professional caliber and their colleagues in the humanities could be seated comfortably in the lecture room of Philosophical Hall. Most could discourse reasonably well on the entire world of learning, which was still small enough to be seen whole. Their successors today, including 450,000 holders of the doctorate in science and engineering alone, would overcrowd Philadelphia. Professional scholars in general have little choice but to dice up research expertise and research agendas among themselves. To be a successful scholar means spending a career on membrane biophysics, the Romantic poets, early American history, or some other such constricted area of formal study.

Fragmentation of expertise was furthered in the twentieth century by modernism in the arts, including architecture. The work of the masters—Braque, Picasso, Stravinsky, Eliot, Joyce, Martha Graham, Gropius, Frank Lloyd Wright, and their peers—was so novel and discursive as to thwart generic classification, except perhaps for this: The modernists tried to achieve the new and provocative at any cost. They identified the constraining bonds of tradition and self-consciously broke them. Many rejected realism of expression in order to explore the unconscious. Freud, as much a



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THOSE WHO APPRECIATE QUALITY ENJOY IT RESPONSIBLY.

literary stylist as a scientist, inspired them and can justifiably be included in their ranks. Psychoanalysis was a force that shifted the attention of modernist intellectuals and artists from the social and political to the private and psychological. Subjecting every topic within their domain to the "ruthless centrifuge of change," in the American historian Carl Schorske's phrase, they meant proudly to assert the independence of twentieth-century high culture from the past. They were not nihilists; rather, they sought to create a new level of order and meaning. They were complete experimentalists who wished to participate in a century of radical technological and political change and to fashion part of it entirely on their own terms.

Thus the free flight bequeathed by the Enlightenment, which disengaged the humanities during the Romantic era, had by the middle of the twentieth century all but erased hope for the unification of knowledge with the aid of science. The two cultures described by C. P. Snow in his 1959 Rede Lecture, the literary and the scientific, were no longer on speaking terms.

THE RIDDLE OF POSTMODERNISM

ALL movements tend toward extremes, which is approximately where we are today. The exuberant self-realization that ran from Romanticism to modernism has given rise now to philosophical postmodernism (often called post-structuralism, especially in its more political and sociological expressions). Postmodernism is the ultimate antithesis of the Enlightenment. The difference between the two can be expressed roughly as follows: Enlightenment thinkers believed we can know everything, and radical postmodernists believe we can know nothing.

The philosophical postmodernists, a rebel crew milling beneath the black flag of anarchy, challenge the very foundations of science and traditional philosophy. Reality, the radicals among them propose, is a state constructed by the mind. In the exaggerated version of this constructivism one can discern no "real" reality, no objective truths external to mental activity, only prevailing versions disseminated by ruling social groups. Nor can ethics be firmly grounded, given that each society creates its own codes for the benefit of equivalent oppressive forces.

If these premises are correct, it follows that one culture is as good as any other in the expression of truth and morality, each in its own special way. Political multiculturalism is justified;

each ethnic group and sexual preference in the community has equal validity and deserves communal support and mandated representation in educational agendas—that is, again, if the premises are correct. And they must be correct, say their promoters, because to suggest otherwise is bigotry, which is a cardinal sin. Cardinal, that is, if we agree to waive in this one instance the postmodernist prohibition against universal truth, and all agree to agree for the common good. Thus

Rousseau redivivus.

Postmodernism is expressed more explicitly still in deconstruction, a technique of literary criticism. Its underlying premise is that each author's meaning is unique to himself; neither his true intention nor anything else connected to objective reality

can reliably be determined. His text is therefore open to fresh analysis and commentary from the equally solipsistic world in the head of the reviewer. But the reviewer, too, is subject to deconstruction, as is the reviewer of the reviewer, and so on in infinite regress. That is what Jacques Derrida, the creator of deconstruction, meant when he stated the formula "*Il n'y a pas de hors-texte*" ("There is nothing outside the text"). At least, that is what I think he meant, after reading him, his defenders, and his critics with some care. If the radical postmodernist premise is correct, we can never be sure what he meant. Conversely, if that *is* what he meant, perhaps we are not obliged to consider his arguments further. This puzzle, which I am inclined to set aside as the "Derrida paradox," is similar to the Cretan paradox (a Cretan says "All Cretans are liars"). It awaits solution, but one should not feel any great sense of urgency in the matter.

Scientists, held responsible for what they say, have not found postmodernism useful. The postmodernist posture toward science, in turn, is one of subversion. It contains what appears to be a provisional acceptance of gravity, the periodic table, astrophysics, and similar stanchions of the external world, but in general the scientific culture is viewed as just another way of knowing, and, moreover, a mental posture contrived mostly by European and American white males.

One is tempted to place postmodernism in history's curiosity cabinet, alongside theosophy and transcendental idealism, but it has seeped by now into the mainstream of the social sciences and the humanities. It is viewed there as a technique of metatheory (theory about theories), by which scholars analyze not so much the subject matter of a scientific discipline as the cultural and psychological factors that explain why particular scientists think the way they do. The analyst places emphasis on "root metaphors," those ruling images in the thinker's mind whereby he designs theories

and experiments. Here, for example, is the psychologist Kenneth Gergen explaining how modern psychology is dominated by the metaphor of human beings as machines:

Regardless of the character of the person's behavior, the mechanist theorist is virtually obliged to segment him from the environment, to view the environment in terms of stimulus or input elements, to view the person as reactive to and dependent on these input elements, to view the domain of the mental as structured (constituted of interacting elements), to segment behavior into units that can be coordinated to the stimulus inputs, and so on.

Put briefly, and to face the issue squarely, psychology is at risk of becoming a natural science. As a possible remedy for those who wish to keep it otherwise, and many scholars do, Gergen cites other, perhaps less pernicious root metaphors of mental life that might be considered, such as dramaturgy, the marketplace, and rule-following. Psychology, if not allowed to be contaminated with too much biology, can accommodate endless numbers of theoreticians in the future.

As diversity of metaphors has been added to ethnic diversity and gender dualism and then politicized, schools and ideologies have multiplied explosively. Usually leftist in orientation, the more familiar modes of general postmodernist thought include Afrocentrism, constructivist social anthropology, "critical" (that is, socialist) science, deep ecology, ecofeminism, Lacanian psychoanalysis, Latourian sociology of science, and neo-Marxism—to which must be added all the bewildering varieties of deconstructionism and New Age holism swirling round about and through them.

Their adherents fret upon the field of play, sometimes brilliantly, usually not, jargon-prone and elusive. Each in his own way seems to be drifting toward that *mysterium tremendum* abandoned in the seventeenth century by the Enlightenment—and not without the expression of considerable personal anguish. Of the late Michel Foucault, the great interpreter of political power in the history of ideas, poised "at the summit of Western intellectual life," the literary critic George Scialabba has perceptively written,

Foucault was grappling with the deepest, most intractable dilemmas of modern identity. . . . For those who believe that neither God nor natural law nor transcendent Reason exists, and who recognize the varied and subtle ways in which material interest—power—has corrupted, even constituted, every previous morality, how is one to live, to what values can one hold fast?

How and to what indeed? To solve these disturbing problems, let us begin by simply walking away from Foucault, and existentialist despair. Consider this rule of thumb: to the extent that philosophical positions both confuse us and close doors to further inquiry, they are likely to be wrong.

To Foucault I would say, if I could (and I do not mean to sound patronizing), it's not so bad. Once we get over the

shock of discovering that the universe was not made with us in mind, all the meaning the brain can master, and all the emotions it can bear, and all the shared adventure we might wish to enjoy, can be found by deciphering the hereditary orderliness that has borne our species through geological time and stamped it with the residues of deep history. Reason will be advanced to new levels, and emotions played in potentially infinite patterns. The true will be sorted from the false, and we will understand one another very well, the more quickly because we are the same species and possess biologically similar brains.

To those concerned about the growing dissolution and irrelevance of the intelligentsia, which is indeed alarming, I suggest that there have always been two kinds of original thinkers—those who upon viewing disorder try to create order, and those who upon encountering order try to protest it by creating disorder. The tension between the two is what drives learning forward. It lifts us upward on a zigzagging trajectory of progress. And in the Darwinian contest of ideas order always wins, because—simply—that is the way the real world works.

As today's celebrants of unrestrained Romanticism, the postmodernists enrich culture. They say to the rest of us, Maybe, just maybe, you are wrong. Their ideas are like sparks from fireworks explosions that travel away in all directions, devoid of following energy, soon to wink out in the dimensionless dark. Yet a few will endure long enough to cast light in unexpected places. That is one reason to think well of postmodernism, even as it menaces rational thought. Another is the relief it affords those who have chosen not to encumber themselves with a scientific education. Another is

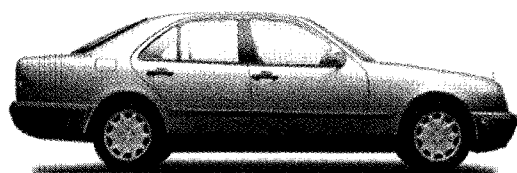
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and the sciences is consilience.*



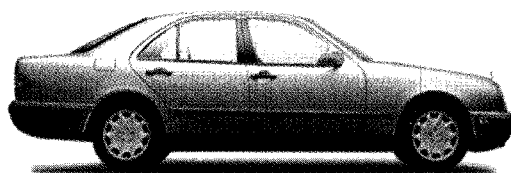
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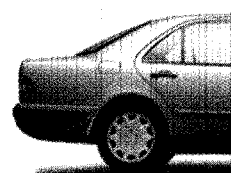
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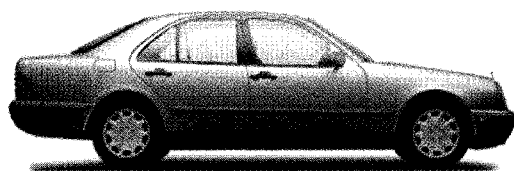
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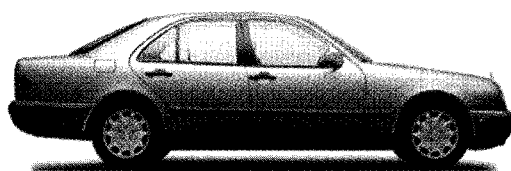
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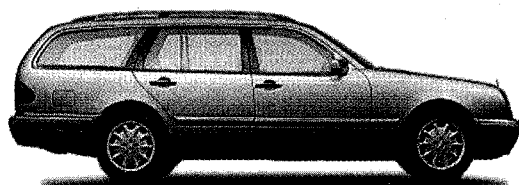
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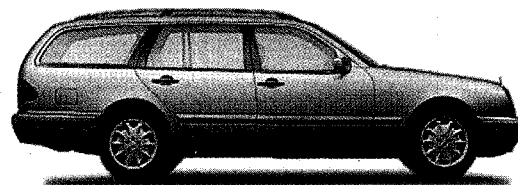
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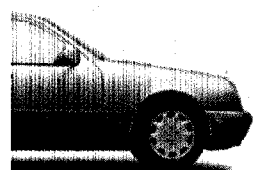
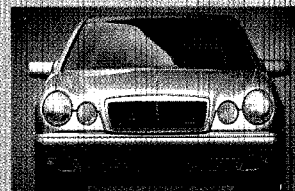
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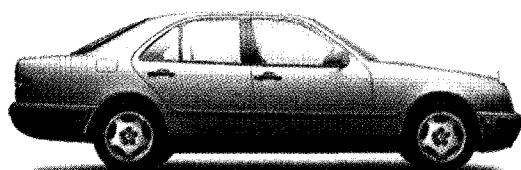
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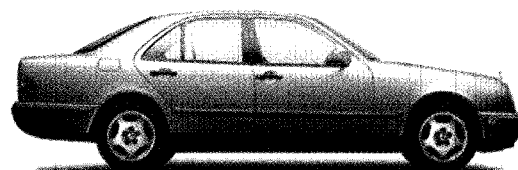
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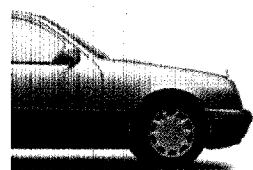
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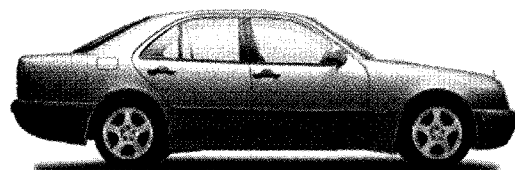
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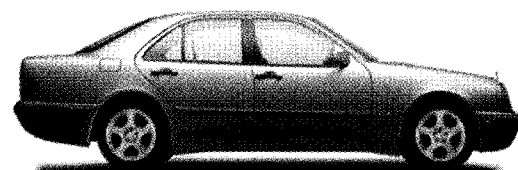
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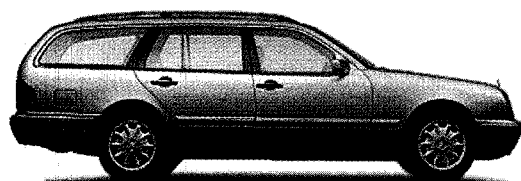
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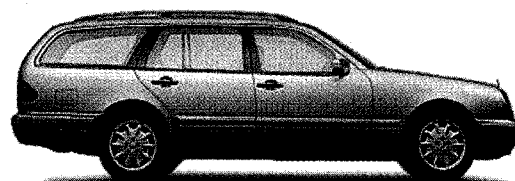
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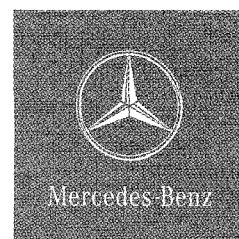
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the small industry it has created within philosophy and literary studies. Still another, the one that counts most, is the unyielding critique of traditional scholarship it provides. We will always need postmodernists or their rebellious equivalents. For what better way to strengthen organized knowledge than continually to defend it from hostile forces? John Stuart Mill correctly observed that teacher and learner alike fall asleep at their posts when there is no enemy in the field. And if somehow, against all the evidence, against all reason, the linchpin falls out and everything is reduced to epistemological confusion, we will find the courage to admit that the postmodernists were right, and in the best spirit of the Enlightenment we will start over again. Because, as the great mathematician David Hilbert once said, capturing so well that part of the human spirit expressed through the Enlightenment, "*Wir müssen wissen. Wir werden wissen.*" ("We must know, we will know.")

THE PROMISE OF CONSILIENCE

IF contemporary scholars work to encourage the consilience of knowledge, I believe, the enterprises of culture will eventually devolve into science—by which I mean the natural sciences—and the humanities, particularly the creative arts. These domains will continue to be the two great branches of learning in the twenty-first century. Social science will split within each of its disciplines, a process already rancorously begun, with one part folding into or becoming continuous with biology, and the other fusing with the humanities. Its disciplines will continue to exist but in radically altered form. In the process the humanities, embracing philosophy, history, moral reasoning, comparative religion, and interpretation of the arts, will draw closer to the sciences and partially fuse with them.

The confidence of natural scientists, I grant, often seems overweening. Science offers the boldest metaphysics of the age: the faith that if we dream, press to discover, explain, and dream again, thereby plunging repeatedly into new terrain, the world will somehow become clearer and we will grasp the true strangeness of the universe. And the strangeness will all prove to be connected and make sense.

In his 1941 classic *Man on His Nature*, the British neurobiologist Charles Sherrington spoke of the brain as an "enchanted loom," perpetually weaving a picture of the external world, tearing down and reweaving, inventing other worlds, creating a miniature universe. The communal mind of literate societies—world culture—is an immensely larger loom. Through science it has gained the power to map external reality far beyond the reach of a single mind, and in the arts it finds the means to construct narratives, images, and rhythms immeasurably more diverse than the products of any solitary genius. The loom is the same for both enterprises, for science

and for the arts, and there is a general explanation of its origin and nature and thence of the human condition.

In education the search for consilience is the way to renew the crumbling structure of the liberal arts. During the past thirty years the ideal of the unity of learning, bequeathed to us by the Renaissance and the Enlightenment, has been largely abandoned. With rare exceptions American colleges and universities have dissolved their curricula into a slurry of minor disciplines and specialized courses. While the average number of undergraduate courses per institution has doubled, the percentage of mandatory courses in general education has dropped by more than half. Science was sequestered at the same time; as I write, only a third of colleges and universities require students to take at least one course in the natural sciences. The trend cannot be reversed by force-feeding students with some of this and some of that across the branches of learning; true reform will aim at the consilience of science with the social sciences and the humanities in scholarship and teaching. Every college student should be able to answer this question: What is the relation between science and the humanities, and how is it important for human welfare?

Every public intellectual or political leader should be able to answer that question as well. Already half the legislation coming before Congress has important scientific and technological components. Most of the issues that vex humanity daily—ethnic conflict, arms escalation, overpopulation, abortion, environmental destruction, and endemic poverty, to cite several of the most persistent—can be solved only by integrating knowledge from the natural sciences with that from the social sciences and the humanities. Only fluency across the boundaries will provide a clear view of the world as it really is, not as it appears through the lens of ideology and religious dogma, or as a myopic response solely to immediate need. Yet the vast majority of our political leaders are trained primarily or exclusively in the social sciences and the humanities, and have little or no knowledge of the natural sciences. The same is true of public intellectuals, columnists, media interrogators, and think-tank gurus. The best of their analyses are careful and responsible, and sometimes correct, but the substantive base of their wisdom is fragmented and lopsided.

A balanced perspective cannot be acquired by studying disciplines in pieces; the consilience among them must be pursued. Such unification will be difficult to achieve. But I think it is inevitable. Intellectually it rings true, and it gratifies impulses that arise from the admirable side of human nature. To the extent that the gaps between the great branches of learning can be narrowed, diversity and depth of knowledge will increase. They will do so because of, not despite, the underlying cohesion achieved. The enterprise is important for yet another reason: It gives purpose to intellect. It promises that order, not chaos, lies beyond the horizon. Inevitably, I think, we will accept the adventure, go there, and find what we need to know. ☛

"When I was in high school, my physics teacher—whose name was Mr. Bader—called me down one day after physics class and said, 'You look bored; I want to tell you something interesting.' Then he told me something which I found absolutely fascinating, and have, since then, always found fascinating."

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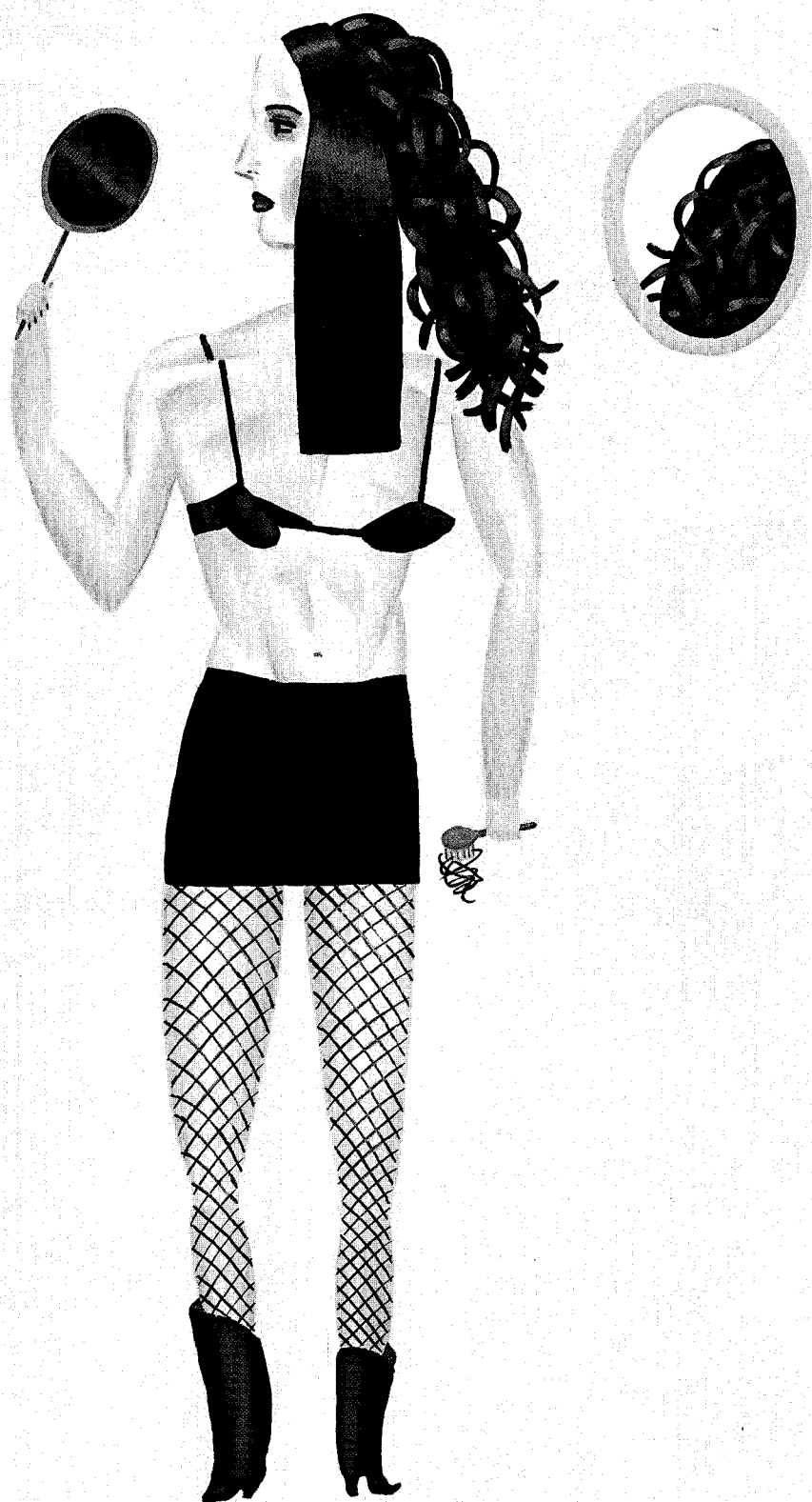
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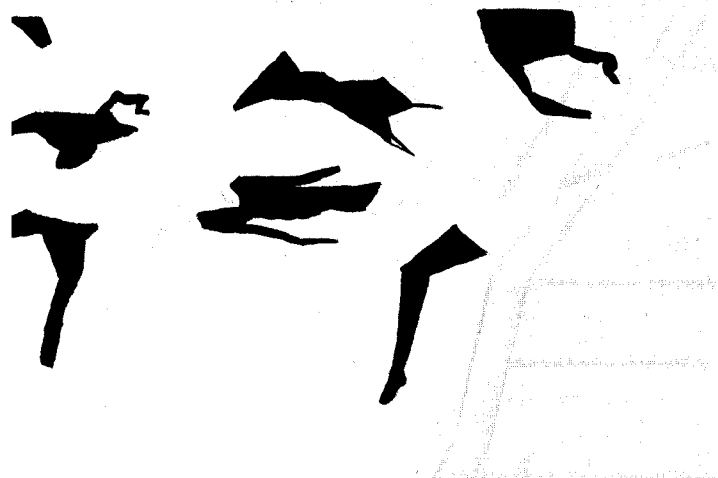
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Marlise is going to Sydney Barton's funeral not because it's an event but
Marlise wants to add her presence, her voice, in a show of solidarity for

The Lunatic, the Lover, and the Poet

by FRANCINE PROSE



MARLISE lifts a fuzzy black sweater (tight, short, angora, all wrong!) with the point of her boot (black lizard, cowboy, hopeless!) and kicks it out of her way as she rips through her apartment, searching for her notebook; then she gives up and scrawls on an envelope, *A woman rising from a sea of clothes, Aphrodite from the ocean . . . ! First line of poem?*

Probably not the first line, but usable . . . Well, maybe. At least, Marlise thinks, she has done *something* today. Rushing back to her closet, she refuses to look at the witch from *Macbeth* running wild in her mirror. No need to stare at that thicket of split ends masquerading as hair, that pale, smeared face, that battered veteran of round after round with every piece of clothing Marlise owns, and not one item that doesn't make her look like Elvira, Queen of the Night!

Marlise has never felt so alone. If only she had a lover, or even a husband, she could ask what she's supposed to wear to Sydney Barton's funeral—not just any funeral, to which Marlise could conceivably wear a black Hefty trash bag, but the funeral of a poet who died suddenly, young, a funeral that will be attended by the entire poetry world.

Marlise sits on the edge of her bed and hides her face in her hands. This is not some . . . party! Not some opportunity for career advancement or . . . romance! If she had any decency, she would join a convent of penitent nuns and lie face down on the pavement and whip herself bloody. Which saint loved pretty dresses? Teresa of Avila? On the same en-

because Sydney was a fellow poet and
this enterprise they are engaged in

velope Marlise writes, *Saint Teresa—Fashion—Guilt—Vanity—Beauty—The Body*.

The previous week Sydney Barton had a fatal stroke while bending to pick up her five-year-old daughter. She was thirty-seven, a beautiful blonde ice princess, beloved by other poets even though her new book, *Night Greeds*, won two major awards this year, one involving real money. Sydney's past had featured love affairs with two generations of male poets. But some years earlier the unpredictable Sydney had married William Spiecher, a much older poet. Soon after, they had a daughter, and soon after that William was stricken with a rare nerve disease. For two years he has been in a wheelchair. Sydney faithfully nursed him. No one dreamed he would outlive her. Sydney was always full of surprises.

Sydney was famously generous to younger poets, especially women. The previous year she gave Marlise a blurb for her first book, *Not Your Average Saint*: "A female Orpheus sings the song that women have always known." It was very helpful, but Marlise has always wondered if Sydney actually read her book, and whether she was implying that Marlise was merely stating the obvious. The song that women have always known! How many women know the song "I'm Too Sexy (for My Shirt)," which Marlise learned by heart during the hellish semester she worked as a lap dancer to pay her M.F.A. tuition, those afternoons at the Zodiac Lounge, the seedy strip club that became the setting for the poems in *Not Your Average Saint*? Not many women, and surely not Sydney, whose work had a formal, cerebral elegance and only rarely a narrative subject—Greek myths and elegiac memories of her Nebraska childhood. Marlise's poems are full of bumps and grinds, hard-ons and bodily fluids.

Already, when Marlise gives readings, young women come up and ask in a whisper if she would read "Cassandra." That poem is almost a direct transcription of a speech—a sermon, really—that Marlise heard from an older stripper, an impassioned credo about giving the customer what he wants. Marlise intercut "Cassandra"'s (her real name was Jackie, her stage name Sassy Cassie) speech with lines from Saint Juliana of Norwich to make it clear that she, Marlise, felt she was hearing God's voice in the rantings of the lap dancer who had twice found and twice lost Jesus.

Marlise knows no one believes her. Civilized people—poets—do not go around talking about hearing God. Marlise often reads her own poem to hear Jackie's voice again: Give the customer what he wants if you can't give it to Jesus—the slob in the hairpiece and raincoat, the UPS driver, the carpenter with the mesh cap and beer gut. Any one of those creeps could be Jesus. Give him his heaven on earth . . .

Marlise tries to take this seriously—not the Jesus part but the part about wholeheartedness, mystical union, and surrender. Why *not* be the female Orpheus? Often she stays up all night working—trying to work—on her poems, so that

she often catnaps during her weekly poetry workshop at Northampton Community College and wakes in chills of sweaty guilt about how little she's giving—able to give—her students.

She should take up lap dancing again; at least then she had a poetic subject, one that taught her how to be present and at the same time *not there*. Something similar happens now when she gives poetry readings. She gives the audience what it wants, coos and sighs and murmurs, lets her voice tremble and break. For readings she dresses in fish-net stockings, boots, a leather miniskirt, and the black angora sweater she has tried and discarded—three times!—for Sydney's funeral.

A funeral is not a costume party! Marlise has to be herself and wear what she would normally wear. Once more—and this is the last time—she puts on the black angora sweater, the miniskirt, the fishnets (ripped!), the cowboy boots. She's certain that she is making a dreadful mistake, but also that wearing anything else would be a lie and an affectation.

Marlise puts on her makeup, determined not to replay the psychodrama she has enacted with her clothes, refusing to consider that cranberry lipstick and charcoal eyeshadow have a certain . . . ghoulish aspect. She runs a hairbrush through her hair, and then quits when she sees the brush furred with long dark strands. Stress is making her hair fall out! What is Marlise's problem? Her first book got lots of attention, if not the prizes she might have liked. She has a career, a teaching job, a dozen poetry students who not only would kill to *be* her but would kill *her* if they imagined it might be useful.

Marlise tosses an antique black Persian-lamb cape over her sweater and skirt. The cape weighs a ton and is stiff with age, but she likes its armorlike quality, and also the stir it causes among the girl and boy poets who would never wear animal fur, let alone the curly pelt of an unborn baby lamb. But isn't Marlise an emissary from another, more animal world—a world above or below such overfine moral distinctions? In fact the strippers Marlise knew would never touch this wormy relic, separating at the seams, leaking puffs of dust . . .

Her boots tap down the stairs. She passes the first-floor apartment of the graduate student who smokes all night, stinking up Marlise's flat. His wife brews herbal tea all day, a no less oppressive smell. Their garbage never contains anything other than empty Vantage packs and boxes of Sleepy Time and, lately, Fast Track, a tea that packs twice the caffeine wallop of the espresso Marlise drinks when *she* stays up, trying to write.

Flinging open the front door, Marlise recoils in vampire horror from the glare of winter sun on the glitter dust of new snow. In her slick-soled cowboy boots she could break a leg. She grabs the railing, aware, as she often is, that her neighbors must think she is a lap dancer—or worse—in this outfit,

picking her way down the icy walk around the lawn to the driveway, taking baby steps, like a hooker in a movie after a long, brutal night.

Well, fuck the neighbors! She's a poet! But what neighbors does she imagine peeking from their windows? Not the graduate-student couples, the hippie health-food-store clerks, the junior-faculty families, all wedged tightly into flats in broken-up Main Street Victorians. She could be out here in a clown suit and they wouldn't be tempted to face this steely Massachusetts morning in January. Marlise looks from house to house, silently begging pardon for telling her neighbors to go fuck themselves so early on a Sunday morning.

She puts out her arms and allows herself to slide the last few steps to her white Toyota Celica, finally getting the attention of the two boys playing pretend ice hockey on the lumpy blotches of frozen dog piss scattered over the empty street. What if she slipped under the car? Would they drag her out? Happily, they lose interest as Marlise fishes in her purse. How could she have forgotten her keys? She just locked her apartment.

At last she finds them. But why won't the car key work?



Marlise jabs at the keyhole until she realizes that the lock's frozen. She rubs it roughly with the palm of her black leather glove.

Just then the church bell strikes ten. Marlise is really late. Great Barrington is more than an hour away—if she knew how to get there. No time to boil water for thawing the lock. On instinct Marlise sinks almost to her knees, inhales, and blows on the lock; then she inhales and blows again. She's

giving her car a blow job in her little hooker outfit. Are the two boys watching this obscene, pointless exercise? Unsuccessful, but perhaps not pointless: Marlise knows that the frozen lock may be a sign from God.

Not that she believes in God, exactly, or in any religion, which is how she came to find herself taking spiritual instruction from middle-aged strippers. She does believe in a power (a Higher Power, as her friends in recovery say) that can whimsically choose to protect her—or screw her, just for fun. Now, for example, the frozen lock is a wise and welcome hand keeping Marlise from committing the (minor, she hopes) sin of crashing the funeral of a woman she hardly knew.

She met Sydney Barton only a few times. The first was hardly a meeting—Sydney came to read at Marlise's college. She was a tall, shining knife of a woman with long hair and a chic black suit, a burning pillar of ice spinning across the quads, trailed by the male faculty, all of them babbling at once. Sydney read from her first book, *Metamorphics*, complex poems that were maybe about Greek myths, maybe about her childhood; the minute they hinted at one thing, they turned into something else. She read in a voice so low that

the audience had to lean forward; she enunciated with a music that Marlise knew was fake; no one else seemed to notice.

The next day her poetry teacher, Joel Simmons (they've stayed in touch; Marlise still sees him at readings and parties), asked the class if they were aware during Sydney's reading that Sydney was in the line of Greek oracles, Roman priestesses, the original female poets.

Temple priestesses! Embarrassing! The students rolled their eyes. Did Joel think they didn't know he had spent the night in Sydney Barton's room at the campus guesthouse? Didn't Sydney know that Joel had

a wife and three kids? They had never thought of their teachers as having romantic lives, and the news about Joel and Sydney depressed the class for a while; it made them see their own lives as somehow sad and deficient. Now that Marlise is teaching, she knows her fellow students were right. Teachers have no erotic lives—Marlise is living proof.

The second time she met Sydney, Marlise was in graduate school; Sydney was brought in for individual conferences

with students. Pregnant, Sydney had changed her style to radiant holy mother in flowing dove-colored jersey with ironic touches: shocking-pink shoes and tights. No makeup—Marlise remembers because she can still see Sydney's blue eyes widening as she rattled Marlise's manuscript in the air and asked, "Did you really work in that place?" Then she said, "I'm sorry. I, of all people, know better. I never *ever* normally ask if poems are based on real events. In fact, it's kind of a rule with me—"

"I work there," Marlise boasted. "Hey. It pays the tuition." She was thrilled that her work had moved Sydney Barton to break her normal rules, had forged an instant intimacy, making Marlise feel so special that only later did she realize that she couldn't recall whether Sydney had said one word about her poems.

Basically, that set the tone for their subsequent meetings—simple social exchanges, always in public venues, apparently pleasant conversations that later whipped Marlise into frenzies of insecurity. What had Sydney really meant? What message was encoded in her deceptively glowing blurb? This, too, involved the breaking of a rule: the rule that only men could inspire such agonies of retrospective scrutiny.

So Marlise and Sydney were not the closest of friends. Sydney didn't have female friends! But that is neither here nor there now that Sydney is dead. In any case, her funeral will pose a challenge for Marlise. When the mourners reminisce about the dead—exchanges that are really anglings for position (who knew her best, who is most bereaved, whose life is most torn apart)—Marlise will have to forgo the personal anecdotes and express her deep admiration for Sydney's work, to remind the poets why they are there and comfort them with the fact of what will survive, what will make Sydney and the rest of them immortal.

Isn't that why Marlise is going to Sydney Barton's funeral? Not because it's . . . an event but because Sydney was a fellow poet and Marlise wants to add her presence, her voice, in a show of solidarity for this enterprise they are engaged in.

God, or Marlise's personal Higher Power, must believe that this is true. Marlise tries the key one last time. It turns. The car door opens.

MARLISE is addicted to Books on Tape. The previous spring she commuted to Boston to teach an adjunct course at Boston University and spent every mile with Richard Burton reading great English love poems. Often when she got to class she felt a little wiggy, and told her students that the Donne and Shakespeare sonnets had literally gotten her high. She was also, as it happened, in love.

By summer she had flung the Burton tape out the car window while driving west at high speed on the Massachusetts Turnpike. The Wyatt poem "They Flee From Me" felt a little . . . close to home. Close to home? It was sheer reportage! A

grim play-by-play of her life. The galling thing was that she'd heard the Goddamn poem a zillion times and never once seen the ax coming.

Marlise has bought a new audio book for the trip to the Berkshires. She rips the wrapping apart with her teeth and pushes *The Poems of Sor Juana Inez de la Cruz* into the player. All the way from Marlise's driveway to the turnpike entrance a woman with the actressy voice of a kindly kindergarten teacher lectures Marlise on the inspirational story of this seventeenth-century woman who broke through the veil of silence that lay so thick on women in the Hispanic colonial world . . . Oh, save it, and read the poems! What kind of feminist bullshit is this? Marlise knows all that. Will she have to fast-forward each time she plays this tape?

Maybe she won't be playing it much—for now a woman reads a poem in Spanish at the anxious clip of a simultaneous translator. Then the kindergarten teacher returns to read a bad translation in greeting-card couplets. Marlise tries to listen through it, around it, to intuit her way back to Sor Juana's description of astral projection, of leaving her body on a shooting star, the spark of the divine . . . Marlise has wasted fifteen bucks. These poetry tapes aren't cheap.

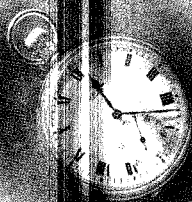
All right. She has to calm down. She's approaching the turnpike and the worst moment in driving: a merge with high-speed traffic. If anyone knew that she shut her eyes and waited to be supernaturally guided (by what?) onto the streaming highway . . . With her eyes closed she takes a few shallow breaths and then hears a voice say, Go now.

Once more something has saved her. Marlise is delighted to find herself wedged midway between a semi-disabled pickup truck and a cautious blue Volvo. Having managed this so reassures her that she lapses into a state of near calm and cruises down the surprisingly empty highway . . . for how long? Half an hour? More?

She's surprised and a little frightened when a green sign edges into her visual field: NEXT EXITS. LEE. LENOX. STOCK-BRIDGE. What about Great Barrington? What happened to her map? She scrabbles under her seat until a blaring horn implies that she has drifted into the next lane. This is how accidents happen. Marlise must be careful. To die en route to Sydney's funeral would be too ironic! Would they make an announcement? The bad news would never get there in time.

The sensible thing would be to pull off at the next rest stop and look for her map, or buy a new one, and maybe use the toilet and thus avoid arriving at the funeral and instantly having to pee—if the First Congregational Church (Marlise predicts an architectural marvel of spare, ascetically tasteful New England Puritan beauty) even has a bathroom. Ten miles later she pulls into a lot beside a huge structure suggesting a cross between a gargantuan horse barn and an Aspen millionaire's ski chalet. She parks and searches for her map. How could it be gone?

Who is out on this wintry Sunday? The usual drifters and



the things you've

You know that feeling, when you can rely on your family, or put your trust in an old friend. That confident,

come to rely on the most

assured feeling of knowing they will be there for you. This unique feeling comes standard with every Camry,

are the things you

along with a comfortable interior, advanced safety design features and quality workmanship. It is a feeling

think about the least.

that comes from reliability and, once you own a Camry, it is one you will never forget.



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carjackers, children squalling with rage, unmollified by the tons of packaged fast food their parents are staggering under. And here's Marlise in her Persian lamb, her miniskirt, fishnets, and boots—for all anyone knows, a hooker plying the glamour trail between Albany and Springfield, servicing middle managers convened at a Holiday Inn.

Marlise locks the car, not wanting to return to a guy squirming up from the backseat floor and putting a gun to her head. Her spine is stiff; the cowboy boots pinch as she hobbles across the lot.

THE lobby of the rest stop—she swam between Scylla and Charybdis. Can she use that metaphor for this place, surrounded as it is by dangers? On one side is a gooey pit of fattening doughnuts and pizza; on the other human sharks pretend to talk on the phone as they trawl for children to abduct, women to drag across state lines. No one knows that Marlise is coming this way. Who will report her missing?

What happened to the self-possessed woman who strutted around the Zodiac Lounge in a see-through nightgown? Now, fully dressed, Marlise is deeply suspicious, and her anxiety

spikes as she walks into the bathroom, empty but for several presences lurking behind locked stall doors.

Just to make things spookier, it's one of those ghost bathrooms in which the toilets flush at intervals whether anyone's there or not. Marlise is still holding her keys. Now she clutches them tighter: brass knuckles, if need be. One poem in her collection is a compendium of lap-dancer safety tips on coming home late.

At least the stalls appear to be clean, and though it's hardly a great place to hang out, Marlise takes a piss so pleasant that afterward she just sits there, grabbing a few seconds of private time—at which point the water beneath her flushes, startling her. She jumps up, wheels around, and drops her keys in the toilet, which, still flushing, promptly sucks them down.

Marlise stares into the bowl. This is really bad. Those are her only keys. This is not something she can ignore until it goes away! Some action must be taken. She has to find someone to help her break into her car and hot-wire the ignition.

She pulls on her tights, straightens her skirt, and runs back into the lobby. She's conscious of people staring at her with heightened, unwelcome interest. Clearly her panic shows on her face. Tough! She's got a problem. But who will lift it off her shoulders? Surely not those sullen youths being tested

THEY CAN'T TAKE THAT AWAY FROM ME

The way the blue car spun tonight
on imperceptible ice—that stop-
time: bare pocked sycamores, the river's
black sheen, the football stadium
empty of Romans, the oblivious sky-
line shining like a festivity—
and, shaken, I could still straighten
the formidable blue invention,
slide the delinquent wheels to a curb;

the way in South China, the car radio
says, believers crowd closetlike shops
to purchase tiny packets of Bear Bile,
a favorite cure-all, while bears go mad
in their abscessing bodies, in cages
barely their height, hurling themselves,
banging their agonized heads at the bars—
lifetimes of pain only, for the dubious
sake of an ancient "medicinal harvest";

the way a mother, stirring sweet batter
in a well-lit kitchen, feels the Pyrex

bowl slip to the floor, and it breaks,
and seeing there'll be no upside-down cake
for dinner, shrieks at her little boy
cowering in the doorway, *Look what
you made me do!* and lunges to smack him,
the way she'd struck yesterday and last week,
though he's as still as a stalled truck;

the way I felt last night when she hung up
on me. I knew I'd hurt her because her mind
's gone, and I refused for my life
to let mine follow again; the way I held
the dead phone, relieved to be not
listening at last—the *memory of all that*,
no no—relieved, selfish, and empty:
wouldn't I choose if I could not to be human,
or any other mammal programmed for cruelty?
No, they can't take that away from me

—GAIL MAZUR

to their limits by the challenge of doling out the right combinations of burgers and fries. Surely not the angry woman wielding tongs like torture implements, squeezing those innocent doughnuts. Surely not the African princess with the crown of tiny braids, forced to live among the peasantry and serve them boxed segments of pizza.

Marlise looks from cold eye to cold eye. No one will make contact except the white slavers and child molesters pretending to talk on the phones. Their conversations must be boring; they have lots of attention left over for leisurely, menacing appraisals of Marlise.

She can't get to the funeral on time. All right. Probably this is another sign from a Higher Power, saving Marlise from the sin of crashing the service. Or else some nasty, punitive Power is making her pay in advance. She can't think of anyone to call. Not her mom in Chicago. Not one college friend—they're all in New York City. Not one ex-lover she can count on not to make up some lame excuse. Not one casual acquaintance. They're probably all at Sydney Barton's funeral.

She should run out on the highway and flag down a passing poet. Hitching on the thruway could get her thrown in jail, but at least she'd meet a policeman who might know what to do with her car. Does this place have a manager? A guard? Anyone in a uniform?

Then Marlise just loses it. She sees herself from above, rocking slowly from foot to foot, making kittenlike cries, turning toward the glass doors and then facing the other way. It's a sort of vertical seizure, from which she can't shake herself loose. She feels defenseless, exposed: anyone could . . . She's gazing at the candy machines, as good a source of guidance as any, when someone taps her shoulder. Marlise jumps and screams.

"Marlise?"

How do they know her name here? Marlise spins around to see a tall, thin young man with caramel skin, yellow-green eyes, and a close-cropped curly pelt dyed chromium yellow. He wears a good suit, olive green, and a long cashmere coat. Only one person looks like this: Spencer Harris, one of her graduate students.

But he has never called her Marlise before. He calls her Ms.—Miz—Moran, very pointedly, very mockingly. Is the problem that she's white? Female? Straight? She can't ask. She's surprised that Spencer hates her, because the students whose poems she likes usually like her fine. And a given of the workshop is that Spencer is a hot young poet. He has already published a chapbook; a reviewer in *The American Poetry Journal* called him a "gangsta Cavafy."

"Oh, Spencer! It's great to see you! You're like an angel from heaven!" This is not the usual tone of her relations with Spencer. He does a double take that seems part staged, part real, and part the recoil of a snake preparing to strike.

"I'm in a terrible mess!" she says. "I dropped my car keys down the toilet!"

Spencer cringes. He'd rather not think about anything Marlise might do in the toilet. Or maybe he's realizing that Marlise's effusive greeting will now reveal its true nature—he'll be asked a favor. They both know that he can't just leave her. They have spring semester to get through.

"Where are you headed?" Marlise says. "Drop me at the nearest Greyhound station; I'll take a bus to Northampton—"

"Actually," Spencer says, "time's kind of tight. I'm late. I'm on my way to a funeral."

"I'm sorry," Marlise says reflexively, and then, "Sydney Barton's, by any chance?"

Spencer nods.

Yesss! Marlise can hitch a ride. Obviously it's fine for her to attend the funeral if this . . . student who knew Sydney less well than Marlise did—if he even *met* her—is undertaking a pilgrimage to honor a dead poet. Funny—Marlise wouldn't have expected Spencer to be such a fan of Sydney's work.

"Sydney was my godmother," Spencer says.

"Your godmother!" Marlise exclaims. So much for the pilgrimage of an unknown, adoring student.

"Where were you going?" Spencer asks.

"Er . . . Albany," Marlise says. "But I'd be happy . . . oh, I don't mean happy, I mean I'd be honored to go to Sydney's funeral. It's not just for family, is it? I'd feel it was a sign that I was *meant* to go in the first place! I'm positive I'll find someone who can give me a ride back later . . ."

"I can," Spencer says gloomily, "if no one else will."

"Oh, thank you, thank you, thank you!" Marlise says.

"Sure," Spencer says grimly. "No problem."

Marlise's spirits dip slightly as they cross the parking lot and pass her car. "Be good," she says, patting the trunk fondly. "I promise I'll be back for you in no time."

She knows without having to ask which car is Spencer's, and heads straight for the elegant, aging navy-blue BMW taking up two spaces—not an encouraging indicator of Spencer's driving skills. Spencer slides into the driver's seat and starts the ignition before he unlocks Marlise's door.

Inside, the comforting smell of leather upholstery mingles with a less reassuring soupçon of marijuana smoke. Oh, great, Marlise thinks. A stoned maniac. But Spencer blends into the river of traffic without closing his eyes or praying. A stroke of good fortune—a miracle—has saved Marlise from disaster. So why does she feel so saddened, as if by some personal disappointment?

"Spencer," she says, almost babyishly, "can I ask you something? How could Sydney have been your godmother unless she was like . . . fifteen when you were born?"

Spencer steers with one arm, concentrating on the road. Marlise is struck by the disquieting fact that his hair undyed would look like her Persian-lamb cape. He tilts his head back and says, "Well, when Julia Margaret—Sydney's daughter—was born, Sydney asked Mom to be the baby's

godmother, and Mom said she'd do it only if Sydney would be my godmother."

"Oh, who's your mom?" Marlise asks.

Spencer frowns. He assumed she knew. "Grace," he says. "Grace Harris."

"I had no idea!" Marlise exclaims. Well, that explains a lot: Spencer's air of entitlement, as if he owned the workshop; his chapbook getting published so soon, though it's true he has talent—more talent than his mom, Marlise thinks, and is instantly sorry.

Grace Harris is a phenomenon in her turbans and African robes, with her soaring vocal range, theatrical accent, and grand gestures, extending her arms at readings so like revival meetings that casual poetry fans come up and declare the muse as their personal savior. Also, Grace has a reputation as a stone-cold killer if you cross her. It's a wonder Spencer is walking and talking.

"Wait," she says. "If Sydney became your godmother when Julia Margaret was born, that's only . . . five years ago?"

"My other godmother died," Spencer says. "I seem to be the kiss of death where godmothers are concerned."

I'll bet you are, Marlise thinks. "I hope Sydney and your mother consulted you this time," she says. "I mean, you were old enough to have some say about who your godmother should be."

Spencer shoots her a warning look. What is she suggesting? That he complain to her—a near stranger, a teacher he doesn't like—about his mother and her close friend?

"Sydney was a fabulous godmother," Spencer says. "What's your point?"

"Oh, nothing! Nothing!" Marlise says, reminded of where they're going: to the funeral of a woman who always took ages to recognize Marlise, but who apparently knew Spencer so well that she had promised to look after him for the rest of her life.

They fall silent and say nothing for many excruciating miles.

"Are you writing?" Marlise asks. A safe enough question, no?

"Well, yeah," Spencer says. "I wrote five poems I really like over winter break."

It wasn't a safe question! Marlise hasn't written five poems in more than a year, or *one* poem, let alone a poem she likes. Well, just because one *likes* one's poems doesn't mean one's poems don't suck! So why is she certain that Spencer's poems are terrific?

"Why the sudden creative output?" Marlise asks.

"Heartbreak," Spencer says.

Oh, Christ, Marlise thinks. How can so many otherwise intelligent students mistake her for their mother? How can they be naive enough to come to her office and ask for romantic advice from a woman who could have killed a fellow motorist by flinging a tape out her window at 80 mph, just because Richard Burton was reading a Wyatt poem some joker

used to read to her—well, to her answering machine? What if she told the students *that* instead of whatever equivocal bullshit about love she passes off as the wisdom of the decade she has on them? Spencer's confession—one word of confession—is different, like a rapprochement, an olive branch extended and looking vastly more attractive now that she knows who Spencer is.

"Who broke your heart?" Marlise asks.

Spencer wriggles his fingers inside his leather glove. "Please. Let's not ruin our day any more than it's wrecked already—all right?"

"Sure," Marlise says. Lucky Spencer, converting his personal grief into poems. For Marlise, heartbreak means she can't finish a sentence, let alone a line of verse. And she'll be damned before she goes public with demented, lovesick yodels for that sonofabitch who led her on and on and then—

"Did you know Sydney?" Spencer asks.

"Of course," Marlise says. "She was incredibly helpful and sweet to me."

"I told her I was taking your class," Spencer says.

"And . . . ?" Marlise can't help asking.

"And nothing," Spencer says. But it isn't nothing! His failure to say anything suggests a troubling . . . *something*. Did Sydney claim she had never heard of Marlise? Or warn Spencer not to study with her? If Sydney had approved of Marlise, wouldn't Spencer say *that*? No, he wouldn't. Spencer's not the type to repeat a secondhand compliment the complimentee would cherish.

"Will you bring the new poems into workshop?" Marlise asks.

"No," Spencer says. "Why would I?"

Why would he? Why would he subject his tender babies to the scrutiny of student poets who know less than he does—or to the jealous, crude sensibility of a loser like Marlise?

After that they ride in silence for the rest of the trip: off the highway, past rolling fields, toward mountains in the distance. Snow has buried the summer lives of the rich, the shuttered gourmet-vegetable stands, the Japanese-restaurant garden, and has revealed the landscape's winter secret: the poor, with their used-car lots and steamy pizza joints, the smoke piping out of their trailers. Spencer takes a smaller road, and several tricky turns lure them over a rickety bridge. Marlise would never have found this place. Despite everything, she's grateful that Spencer came and saved her—even if riding with him has left her feeling far too damaged and vulnerable to deal with a church full of poets.

THE calendar-pretty white church is nestled in a calendar-pretty white valley. Marlise recognizes it from her fantasies of where Sydney's service would be held, a scene she imagined in accurate detail except for the cars lining the side of the road.

"Christ," Spencer mutters. "What the hell? You'd think the Grateful Dead was playing."

He parks and shuts off the ignition. When he turns to look at Marlise, she sees that his eyes are full of tears.

"I apologize if I've been . . . chilly," he says. "I'm just so sad about Sydney."

"I know that," Marlise says, lying. With all the mental gymnastics she has put herself through, she never considered that

changed into the sheer shortie nightgown: *This isn't me, this isn't me*. And pretty soon it wasn't, she wasn't herself—or, rather, she *was* herself, watching herself do things that her normal self would never do.

But now Marlise isn't stripping and encouraging poets to stuff currency down her bra. She is, however, wondering how people will see her. Though possibly, at this tragic event, they will not see her at all; maybe invisibility is

what she's afraid of. How cruel of a Higher Power to mix, in equal parts in one woman, outrageous exhibitionism and clinically low self-esteem. All her hard-won strength has been removed by one instant of bad luck at a highway rest area and one grueling car ride with an icky graduate student. She's been changed back into her adolescent self, for whom just walking into a crowded room was a Herculean labor.

But perhaps Marlise's real fear is less metaphysical. For there, lounging on the church steps, slightly apart from the rest, is Dermott Rooney, the very same poet who caused Mar-

lise such pain this past summer in Boston.

Centuries after Thomas Wyatt, Marlise lived out his poem with the stupefying literal-mindedness of a grade school dramatization of *Hiawatha*. *They flee from me, that sometime did me seek*. Well, Dermott sought her, *sought* her (stalked her was more like it), first with coffee dates, then with expensive dinners (he paid), phone calls, messages on her answering machine in an increasingly musical, increasingly seductive Irish brogue.

The worst part was that Dermott had slept with every female poet Marlise knew. His MO was common gossip. Marlise wasn't the first he'd besieged, the first he'd told that this was love, wholly different from what he'd felt for the women before her. The poetry grapevine buzzed with the voices of women who liked nothing better than to repeat the lies Dermott told them.

But no. *This* was the worst part: what finally seduced Marlise was the major production Dermott made about their both being Irish. He said he'd been holding out for true love because only an Irish Catholic girl could fathom the whirlpools of grief and guilt in his Irish Catholic boy's soul.

She feels better—she didn't need to take it all so personally—and at the same time worse, for having been so self-centered.

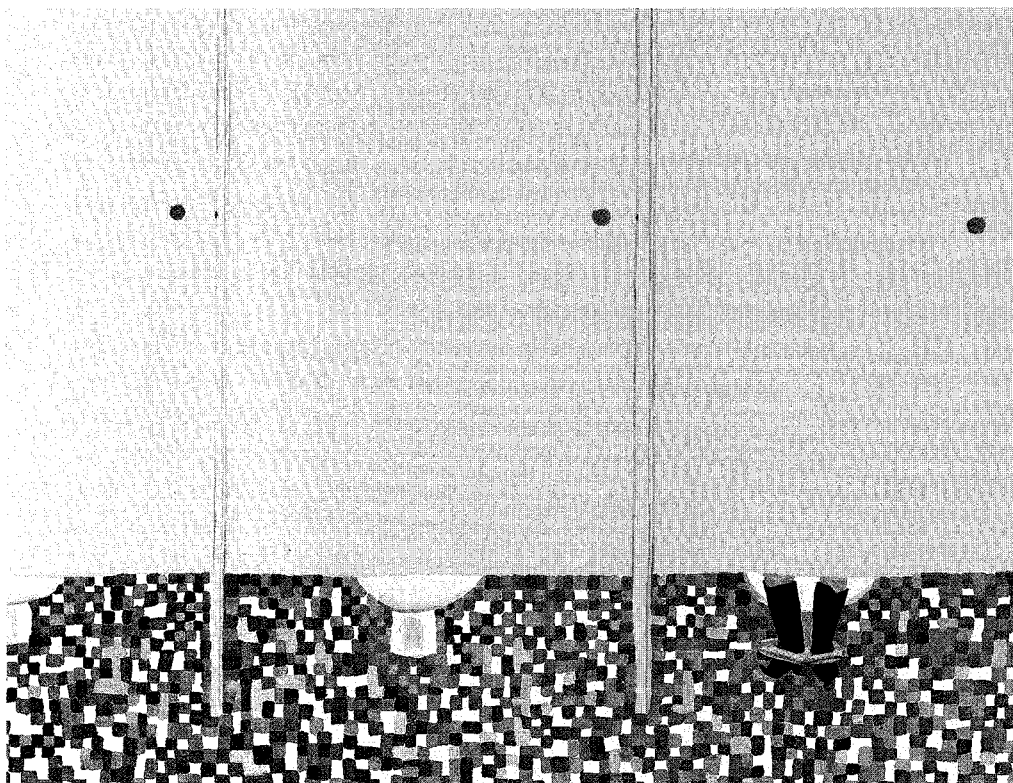
"I'm sorry," she says. "I'm just so grateful for your rescuing me and bringing me here."

"It was nothing," Spencer says, restored to his chilly self. Then he jumps out and walks briskly ahead, leaving Marlise to pick her way down the icy road to the church.

A dozen people are hanging out in front of the church, like some sort of mythical guardian herd. Smokers, Marlise thinks. *Smokers outside the gates of hell, like many-headed dogs*. Better: *Smokers, like many-headed dogs, outside the gates of hell*.

Well, better smokers than many-headed dogs; better smokers than nonsmokers. Smokers are friendlier, and if one has to have guardians at the gates, smokers are less likely to make one feel weird. Marlise feels weird enough, mincing along the slippery road to avoid falling, and flashing way too much thigh in full view of the smoking poets.

Alternatively, Marlise could puke right here in the driveway; "butterflies" hardly describes the insect swarm in her stomach. She had a sort of mantra she used to say at the Zodiac Lounge as she took off her sweatshirt and jeans and



Marlise pointed out that his Irish-Irish and her Irish-American were really quite different, to which he replied that if DNA could survive from the Neanderthal era, how could it be changed by a mere two generations on different sides of an ocean? Marlise's misfortune was that she knew no other Irish-American woman poet who might have heard that same line.

The very first time she slept with Dermott, she knew she'd made a mistake. The sex had a distracted quality: forgetful, absentminded. This was something she *had* heard about him, and so she knew that the romance was over, though weeks passed before he started speaking the coded language—missed dates, unreturned calls—in which certain men choose to communicate seemingly basic information. *They flee from me, that sometime did me seek . . .*

Seeing Dermott at the funeral, Marlise thinks, He and Sydney were lovers. But Marlise asked him once, point-blank, if he'd slept with Sydney Barton. He said, "No, and more's the pity. Sydney and I were never in the same place at the right time under the right lucky stars."

Once more Marlise believed him—for an even lamer reason than their both being Irish. She believed him because he didn't say that he hadn't *wanted* to sleep with Sydney, didn't bother pretending she wasn't his type, which is what men usually say when they lie about wanting other women. Then Marlise confided in him the whole story of her brief, confusing exchanges with Sydney, of Sydney's uncanny power to unsettle Marlise.

So Dermott is not only an ex-lover who ditched her under humiliating circumstances but also perhaps the one person at Sydney Barton's funeral who knows that Marlise hardly knew the deceased. Dermott probably won't blow the whistle on her; very likely he doesn't remember the details of Marlise's complex feelings toward another female poet.

Now Dermott gathers her in a bearlike embrace, and Marlise alarms them both by bursting into tears that leave tracks on his leather jacket. Is she crying over Dermott? For herself? Dermott assumes it's for Sydney, because as he strokes Marlise's hair (thank God she washed it this morning), he says, "Oh, the poor thing, leaving that wee girl and crippled husband."

It's the first time she has heard Dermott's voice since the middle of last summer—well, his living voice. She saved the answering-machine tapes—the Wyatt poem, the Donne sonnets he read into the phone, the lilting declarations of love that segued into mumbled excuses about forgetfulness, sudden crises, and previously unforeseen claims on Dermott's time.

The answering machine still listens for him. No. The phone machine still misses him. No. She can think of no way to use the phrase "answering machine" in a poem—nor does Marlise want to write such a poem. She hates poems that are like personals ads, displays of the poet's capacity for pas-

sion, sensitivity, and grief, invitations to the reader to come kiss it where it hurts.

They haven't spoken in months, and now nothing either says reveals that they are anything more than two friends grieving together over Sydney Barton. Dermott parts her hair with his fingers and kisses the top of her head, a gesture that once conveyed tenderness and affection and now seems like a mocking display of what she will never have. Marlise lifts her face from his chest and is about to ask him to please get his fingers out of her hair—she has had occasion to say this to men at the Zodiac Lounge—when Dermott fixes his liquid brown eyes on hers and says, "Oh, Marlise, what a beautiful soul you are. It's angelic of you to come today."

Is he mocking her? He isn't. What was she so angry about? She grabs his upper arm, through his jacket, as if to make sure he won't leave till she's finished saying "Oh, Dermott, it's the strangest thing. I wasn't planning to come here today. I was on my way to Albany . . ."

As Marlise pauses to figure out why she might have been going to Albany, Leonard Kanellis comes over. Leonard is known for the many prestigious and lucrative poetry awards he has won and equally famous for a trail of wrecked cars, broken hearts, and parties ruined by his penchant for urinating in corners, smashing plates, and running off with his hostesses. But lately, in his mid-fifties, Leonard has settled down and married the dowdy editor of a home-decorating magazine.

"My man," Dermott says. "How's married life? How's Eliza?"

"Six months pregnant," Leonard mutters darkly.

"Congratulations!" Marlise says.

Leonard registers Marlise's presence. They've met a few times, and frankly, Marlise was always insulted that Leonard never hit on her. Does he recognize her now? It's hard to tell what Leonard is seeing. The rumor is that he has quit drinking—but not today, apparently. His red eyes swim toward her, and he says with drunken courtliness, "I'm terribly sorry. You were saying something, and I rudely interrupted."

"It's okay," Marlise says. "It wasn't anything—"

"*You were saying something.*" Leonard insists.

Dermott looks at Marlise.

"Well," Marlise says, "I was just saying that I hadn't planned to come today, even though I loved Sydney." She looks at Dermott, but his face shows only desire for her to get them through this moment. "But my car broke down"—she won't mention her keys in the toilet—"on the highway. And one of my students"—she can't help raising her voice, so that Leonard knows she *has* students—"found me and rescued me. Spencer. Sydney's godson."

Leonard turns to Dermott. "Who is this chick? And what is she dressed for? Halloween? She looks like one of those inflatable sex dolls."

Dermott says, "Easy, Leonard, man. She's not just an-

NPG Statement on Population

We Believe that the Optimum Rate of Population Growth is Negative

We believe that the optimum rate of population growth for the United States (and for the world) is negative until such time as the scale of economic activity, and its environmental effects, are reduced to a level that would be sustainable indefinitely.

We are convinced that if present rates of population growth and economic growth are allowed to continue, the end result, within the lifetimes of many of us, would inevitably be near universal poverty in a hopelessly polluted nation and world.

We agree with Professor Herman Daly who has pointed out that the human economy is a subset of the biosphere, and that the **current scale of economic activity relative to the biosphere is already far too large to be sustainable indefinitely.**

Stabilization Is Not Enough

We believe that calls for merely slowing down rapid population growth, or for stabilizing population at present or even higher levels, **are totally inadequate.**

Such proposals, while presented as a solution, **fail to address the central issue:** how to create a national (and world) economy that will be sustainable indefinitely.

At present or at even higher levels of population, neither the application of science and technology, nor simplifying life-styles, nor any combination of the two, can offer any hope of reducing our impact on the environment to a sustainable level.

We Need a Smaller Population

We recognize that our impact on the environment in terms of pollution and resource depletion is the product of our numbers times our per capita consumption of energy and materials. Thus, there are only three ways by which that impact can be reduced:

- By reducing the size of our population by a negative rate of population growth.
- By reducing over consumption (in the United States and other developed countries) by simplifying life-styles.
- By reducing resource depletion and pollution per unit of consumption through more efficient use of energy and materials.

Population size is by far the most critical of those three variables. **Nevertheless, our present scale**

of economic activity is so large relative to the biosphere, that all three measures are needed in order to reduce it to a sustainable level.

An Urgent Need

Over 20 years ago, when our U.S. population was far smaller, (about 202 million, rather than our present 269 million), Professor John Holdren correctly saw the urgent need for a negative rate of population growth. At that time he wrote,

"...What is surprising... is that there is not more agreement concerning what the rate of change of population size should be. For given the uncertain, but possibly grave, risks associated with substantially increasing our impact on the environment, and given that population growth aggravates or impedes the solution of a wide variety of other problems... it should be obvious that the optimum rate of population growth is zero or negative until such time as the uncertainties have been removed and the problems solved."

A Population Goal for Our Country

We must have, first of all, a nationally-determined population goal for our country, accompanied by effective policies to achieve it.

We urge Congress and President Clinton to set, as a top priority national goal, **the achievement of a negative rate of population growth for the United States until such a time as the scale of our economic activity is reduced to a sustainable level.**

We also call on our political leaders to urge other nations to pursue a similar goal.

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other pretty face. This is Marlise Moran. She's published a tough little first book of poems."

"Marlise, then," Leonard says. "Marlise, do you honestly imagine that one person in the universe gives a rat's ass about how you got here today?"

Marlise's heart is pounding so hard that she thinks she, too, may die. Two dead female poets in one week. That will serve someone right!

"Come on, Leonard," Dermott says.

"Come on nothing," Leonard says. "Sydney's dead."

"I know that," Dermott says.

"You fucker," Leonard says. "You went after her. You stalked her. And then you left her. No one hurt Sydney that way . . ."

Wait a minute! Marlise thinks. What does Leonard know? The question takes her mind off his nastiness to her and refocuses it on this revelation about Dermott—and Sydney. But just then the church door opens and an elderly man pokes his head out and says, "All right. Pipe down, guys. They're getting ready to start."

"Shall we?" Dermott says gallantly, and waves Marlise in before him. The church door shuts behind her. Neither Dermott nor Leonard follows. They must have stayed outside on the steps to continue their fight.

THE stark white New England interior is so crowded that some people have started trudging upstairs to a balcony. Marlise climbs partway to the balcony and then turns and looks down at the tops of heads. In the center of the church is an empty space and a plain pine coffin. How can that be Sydney, when Sydney still exists as the woman crossing Marlise's campus with the sleek forward thrust of a hood ornament on a vintage car? That cannot be Sydney. But Marlise knows that it is; a wave of grief breaks over her and washes away every consolation, every distraction, leaving nothing but the pure fact of death. Dead is what Sydney is. What Marlise will be. The insult. The injustice.

People stand in concentric circles, giving the coffin lots of room—breathing room, Marlise thinks. On the inside edge of the circle is Bill Spiecher in his wheelchair; beside him is Julia Margaret.

Tall and erect, with long blonde hair, dressed in a black velvet frock, this tiny Victorian princess out of a Lewis Carroll photo holds her father's hand and with the other holds Spencer's. So Spencer is front and center, the chief mourner and consoler and witness to Marlise's shame in the thruway snack bar. Grasping Spencer's other hand is Grace Harris (Spencer's mom is how Marlise thinks of her now), in a royal-blue African dress and a huge knit version of the Mad Hatter top hat worn by the Cat in the Hat, perched on a nest of yellow braids: a Harpo Marx effect.

The church door opens with a shocking bang that divides

the crowd like the Red Sea to make way for Leonard Kanelis, who strides down the newly cleared path straight to the inner circle and, without pausing, kneels in front of Julia Margaret. He kisses her forehead, a kiss the child calmly accepts. Sydney has cloned herself, Marlise thinks. But she can't let herself have that thought. Sydney's in a pine box. The little girl has no mother.

Rising, Leonard falters and steadies himself. Then he stands and places his hand—warmly, bracingly—on Bill Spiecher's frail shoulder. With painful effort Bill tilts his chin upward, but his face has lost the fine tuning needed to show emotion, so it's unclear whether his grimace is soft with fellow feeling or twisted with horrified rage.

Grace opens her arms to Leonard, and in an appalling moment Leonard steps backward and formally shakes her hand and then Spencer's. He lowers his head in silent prayer and then says in his deeply honeyed voice, with its trace accent (Greek?), audible only when he reads, "Live fast." He pauses. "Die young." Another pause. "Leave a beautiful corpse." He waits. "Good advice. Exquisite corpse. And Sydney was exquisite. That was what you noticed first. Her heartbreaking beauty. But very soon you realized that Sydney was not just a pretty face . . ."

Hang on a second, buddy! That's what Dermott said earlier to Leonard about Marlise. Is he making this up as he goes along? Now, having reached a full stop, Leonard forgets where he is, and the crowd seems to realize, as if with one mind, how drunk he is.

"Exquisite," Leonard reminds himself. "Not just a pretty face. Also a brilliant talent. The great mystery of art! No one else wrote like Sydney, no one dared to sustain the intensity . . ."

Leonard launches into a hymn to Sydney's work—an extended blurb, Marlise thinks, a posthumous rave review, every word of which maddens Marlise until she feels like a bull bristling with the picadors' spears, pierced by every glorious phrase Leonard heaps on Sydney's reputation. All right. Marlise has to admit—accept—that this will never happen to her. No worshipful crowds will grieve over *her* exquisite corpse; no prizewinning poet will deliver *her* eulogy. Why? It's not a question of talent. Marlise's first book is as good as Sydney's first book—and a hell of a lot more honest. But Sydney was prettier, in that frigid ice-maiden way, and she knew how to use her looks—a trick that Marlise has never quite mastered. Marlise's style is good only for briefly snagging the interest of poets interested in anything wearing a skirt.

God help me, Marlise thinks desperately. She knows a prayer when she hears one. *God Help Me. Those three words ring down like coins, like slot-machine cherries.* Where's her notebook? In her car. Her car is by the side of the highway.

Leonard says, "Every one of us loved her." Finally he

stops speaking and shrinks so visibly that Marlise thinks she can hear a rush of air hissing from his chest.

Hold on. Marlise can't be the only one who didn't love Sydney Barton. So maybe Leonard is equally wrong about the brilliance of her talent. Or is he aiming a sly dig at Sydney's busy love life? Were Sydney and Leonard lovers? Perhaps that's why Bill Spiecher grinned or glared so hatefully at Leonard.

Marlise looks down at Bill Spiecher, angled like a marionette in his rough tweed suit and his wheelchair, his head at a funny angle. His lips writhe constantly, like the tentacles of some hungry undersea creature. Who knows what emotion—if any—he feels when Leonard pushes his wheelchair forward in a wordless introduction. It is Bill's turn to speak. Their suffering brother poet, their brother whose wife is now dead.

A shudder—a mini-seizure—rattles Bill's husklike frame, and Marlise shudders too. Maybe Leonard Kanellis never made a pass at Marlise, but Bill Spiecher did. Marlise was in graduate school. This was before Bill married Sydney. They were at a party—somewhere, where?—after a reading. Marlise and Bill and a group of other poets were talking in the kitchen. At some point after the others left (Marlise must have been drunk), Bill Spiecher leaned forward and brushed his hand along her face, taking a swatch of her hair in his fingers.

Okay. Marlise has good hair. Even she has to admit it. She was exaggerating about the witch in *Macbeth*. Her hair, a mid-shoulder-length fawn cape with glints of orange fox, has always been an advantage. So what? Sydney had her sheet of shiny blonde Rapunzel tresses. You were not supposed to notice the correlation between success and hair among female poets. And let's face it, Marlise's hair was the reason she got hired and treated so well at the Zodiac Lounge.

Dermott used to play with her hair. Marlise liked that. But she didn't like Bill Spiecher's absently, repeatedly, rubbing a lock of her hair between his thumb and fingers.

At first she was merely irritated. Did her hair need washing? Quickly this vague discomfort flared into visceral panic, as if a moth or a flying beetle were buzzing in her hair! She shook her head with a violence hardly demanded by the situation; a glance away or a light shrug would have done as well.

Bill Spiecher never forgave her, never spoke to her again. Now Marlise wants to kneel before Bill Spiecher, just as Leonard genuflected to Bill and Sydney's daughter. She wants to take Bill's limp hand and entwine his thick, useless fingers in the tangle of her hair—or perhaps she only wants to think that she does.

Bill's whole face contracts in the effort to produce one word—moaned in the hoarse vibrato of the profoundly deaf. "Vulcan," someone whispers. It travels through the room. "Vulcan" is a poem from Sydney's last collection.

Slowly Bill recites the poem. Every word is agony, but he

knows it by heart. Marlise also knows the poem, which is lucky, because no one could fathom a word of it in Bill's halting, labored recitation. She has always imagined the poem as a Redon painting, a wash of gold luminescence in the center of which is a keyhole through which the reader can glimpse Venus watching her husband pound red-hot metal on his forge and loving the god for his damage, his age, his hunchbacked, dwarfish innocence, which she has betrayed with every mortal and male deity in creation.

This is what Bill has chosen to recite at his wife's funeral? Happily, no one can understand, because the poem is clearly about his illness, his weakness, his deterioration—not about Sydney's faithlessness, so far as Marlise knows. Certainly the poem is full of love, but it's admixed with pity for the weakened state of a once-powerful man.

Bill doesn't care how he's portrayed in the poem; he's content to be in it. That's men for you: responding with Pavlovian drool to the mere mention of their names. Marlise longs to say this to someone: a teensy jab of revenge for Leonard's recent nastiness to her and for Dermott's less-recent betrayal. But female poets don't talk like that except on rare occasions when no male poets are within miles and the ladies have been drinking.

The Zodiac women would understand, and for one loony moment Marlise wishes she had brought them along, if only to see what the strippers would make of these guys, who would play with their breasts if they could, who would pay the women to writhe on their laps, but who act as if they were above all that—certainly above paying. To arrive at Sydney's funeral with an entourage of bargirls would get Marlise talked about for a while, but when the talk was over, she could forget about being taken seriously for the rest of her life. How fair was *that*, when a guy like Leonard could pee in corners and still win every major literary prize? Sometimes Marlise comforts herself by thinking that the Zodiac Lounge is the real world and the poetry world is the pretend world. But she has been kidding herself. These poets are her real life. The other was the illusion. The spangled bras and panties—she was always just trying them on.

Sheer will has brought Bill to the point of mumbling some last sounds, dimly familiar: the end of Sydney's poem. Bill falls silent, and the poets exhale a collective sigh that magnifies each separate breath into a single Tour-etteish groan.

Julia Margaret lets go of her father's hand and, with a presence freakish in a five-year-old, approaches her mother's coffin. Already Sydney has trained her, fashioned another little Princess of Art, streamlined and groomed for success. Shouldn't Marlise be consoled that Sydney still exists in her daughter? And what's wrong with a child who can face a crowd of adults—as opposed to, say, an adult woman dancing in sequined underwear that guys are stuffing with bills? Could Sydney, on the other side, be guiding Julia

Margaret to wait for the total attention that Sydney insisted on before she began her slow seductions of the audience?

The little girl stands soldier-straight, her thin arms plumb at her sides. The crowd's silent straining to listen is painfully intense as Julia Margaret waits a few more beats and then says, in a quavering voice, "My mom was picking me up when she died."

Marlise can't believe she's seeing this! The moment is incredible. Poetry history is being made in front of their very eyes. Marlise's sensors are telling her that half her fellow mourners are looking for ways to put this into a poem.

The girl says, "My mom was lifting me so I could see the full moon."

Well, these words practically bring down the house! Sydney's legend leaps moonward. The beautiful woman, the lovely child, the poet and her daughter, the bright moon, the symbol of something or other, all that moonlight on all that blonde hair . . .

Marlise thinks of Joel Simmons telling her undergraduate seminar that Sydney was in the direct line of Greek oracles and Roman priestesses. Now she searches the room for Joel and spots him on some low steps leading up to a window. He doesn't look a day older than when he was her teacher. She thought he was old then, with his job, wife, and kids. But he couldn't have been much older than Marlise—she understands that now.

She looks to see if the poets have been snookered by this junk about Sydney, the girl, and the moon. Except for Joel, apparently, they know that the idea of a special relationship between poets and the moon is New Age Jungian mush, Yeatsian baloney. Except for Joel and . . . Shakespeare. *The lunatic, the lover, and the poet . . .* the speech comes back to her.

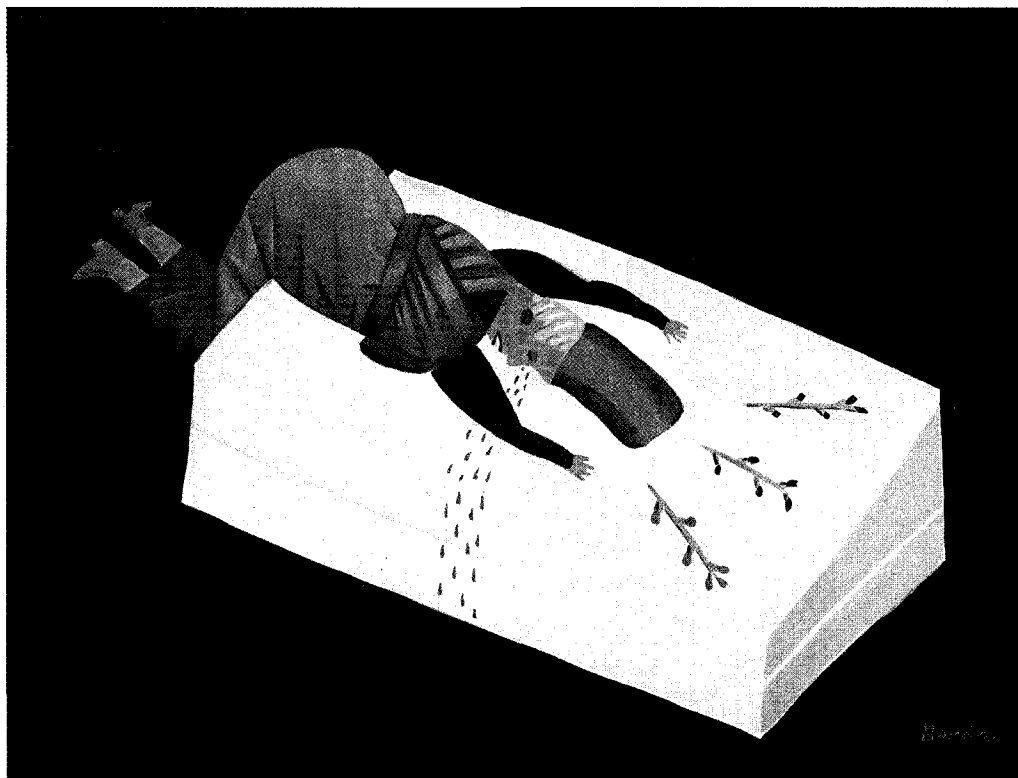
The lunatic, the lover, and the poet are of imagination . . .

The crowd is enchanted, totally wowed. They're watching with their jaws slack; they can moongaze for a while—poets are supposed to! Sydney's letting them shed their cynical reserve. And Sydney has credibility, because of who—how young—she was. She has the ultimate authority that comes with actually being dead. For a moment they believe in the muse, in lunar communication.

NO wonder Grace Harris is goosed right into action. Grace lifts her arms, and some ineffable wind catches her robes and sails her toward the coffin, where she sinks to her knees with the painful deliberateness of a kneeling camel. After much scooting and easing herself into position, she places one side of her face on the coffin and weeps, utterly surrendered to grief but still raising one arm in the air where it can hold taut the thread of audience attention.

Grace stays draped on the coffin for so long that the crowd gets restive. Oh, poor Spencer! Everyone's looking at him. He's Grace's son, after all. Poor Spencer doesn't know what to do. He takes a step toward his mother, as if to comfort her or help her up, but, half turning, Grace bats him away—like James Brown, Marlise thinks with glee. And yet Spencer's humiliation is too excruciating to watch; Marlise focuses on the periscope of Grace's upraised arm, rising steadily higher now as she slowly bobs to the surface, already speaking—orating—a poem.

Grace gives every syllable its full coloratura vibrato, closing her eyes and extracting each word from the depths of her very soul: "Sister poets, sister angels, flying like



geese in vee formation, not honking but making music . . ."

Not even the tragic fact of Sydney's early death can soften the poets' brains enough to make them think this poem doesn't suck! Bemused glances whiz past Marlise, eyes roll back into heads at this graphic demonstration of what they all know about this woman with more name recognition than the rest of them put together.

"Sister Emily D.," Grace sings out, "flying at the head of

the vee, Sister Marianne M. Sister Sylvia P. Sister Elizabeth D. And let her fly with the others, dear God. Sister Sydney B.”

Jesus! Give us a break! The voice that screams in Marlise’s head is so loud that she can’t believe she hasn’t spoken the words. Does this count as another prayer? She recalls a line from Rilke: “Shorter are the prayers in bed, but more heartfelt.” Well, the most heartfelt of all must be prayers incorporated into bad poems at memorial services.

“Skyward! Heavenly!” Grace cries. At last her poem is over.

She tips back her head and starts to sing. “On the wings of a snow white dove, He sent his own sweet love . . .” Prickles of embarrassment shrink Marlise’s scalp.

“Brothers, sisters. Join me.” Grace must be totally nuts! These poets don’t know this hillbilly hymn and wouldn’t sing it if they did. She should have picked a Negro spiritual. That might at least have shamed a few liberals into compliance.

Grace waits, as Sydney waited, as Sydney’s daughter waited. But they were waiting for silence. Grace is waiting for a response, and she doesn’t hear a peep. This is cruel, letting someone just hang there like that, not just anyone but Grace Harris, a black woman, a famous poet. Marlise shouldn’t let them do it—but she’s not joining in. Two or three female voices venture a few notes, but their faint pipings trail off when they realize they’re on their own.

“Brothers, sisters,” Grace exhorts, a little bullyingly now.

It’s a standoff. No one looks at anyone else. The worst part is that they’re enjoying Grace’s payback for getting famous by pulling stunts like this. They’re family, poetry family, and family doesn’t fall for the shit that works on everyone else. At the same time, they’re writhing over the awfulness of this free-fall plummet from the grace of Sydney’s tragic death. The confidence leaves Grace’s smooth dark face, deflating it cell by cell. Why doesn’t anyone help her?

Grace is lightly wringing her hands, and Marlise can’t help thinking of that time in the Zodiac Lounge when a new stripper—a pale, starved child who looked about fourteen—pranced onstage her first day on the job. She danced out and just froze there in her pigtails and schoolgirl dress with the spangled underwear underneath. Her geisha-white face contorted and she hugged herself while the music boomed “I’m Too Sexy (for My Shirt),” the customers’ favorite. She must have lied to Nick Spyrokis, the owner, about having worked before.

The bar was crowded. Not one guy made a sound, not a word, certainly not the catcalls or jeers you’d hear in the movie version. There was silence, pity and terror for the girl tumbling down the rabbit hole, which the music was trying to cover like one of those animal traps thatched with branches and leaves. How sweet those men were, hardly breathing while the girl wrapped her arms around her skinny boy’s body, until Nick—who until then Marlise had dismissed as

an asshole—wrapped her in his overcoat and tenderly led her offstage.

In the poem Marlise wrote about this, for *Not Your Average Saint*, she compared Nick Spyrokis to one of Rilke’s angels, and the angel’s wings to the arms of the cashmere overcoat you’d imagine a Mafia don wearing to court for his trial. Not one guy in the Zodiac Lounge was pleased by what happened, so obviously they were nicer guys than some of the poets here today.

“Spencer.” Grace’s voice wrenches Marlise out of her reverie. “Sing with me, boy.”

Spencer clenches his eyes shut and shakes his head.

“Spencer,” Grace says.

“Come on,” Spencer says. “Grace. Please.”

Sympathy for Spencer wells up from so deep in Marlise’s stomach that it feels confusingly like that fluttery weakness, the first sign of lust or love. But Spencer is gay and he hates her, so Marlise’s feeling for him can have none of the greedy acquisitiveness of lust or love. It’s purer—more like the love God must feel for his creatures, the compassion that Jackie, a.k.a. Sassy Cassie, preached for the customers with their beer guts encased in cheap, wrinkled suits.

This rush of transcendental emotion lasts just long enough for Marlise to realize that she may yet have to ask Spencer for a ride to the rest stop, or even to Northampton. And he’s unlikely to be in the greatest mood after witnessing—enduring—the extended self-crucifixion of his mother. Sydney is dead, the poets are acting out, everyone’s jammed into the church listening to bad poems, but that doesn’t change the fact that Marlise’s car is at the rest stop—she hopes!—and she has no transportation from the middle of this nowhere to that big nowhere somewhere else, that daily nothing, her daily life. Easy, Marlise tells herself. Where there’s life, there’s . . . clichés parade through her mind, blowing their tinny whistles, singing their silly songs on the theme that living is better than dying.

And now—like a testament to the power of positive thinking—she hears a man’s voice from the back of the church, a melodious Irish tenor soaring with barroom passion: “On the wings of a snow white dove, He sent his purrfect love . . .”

Still singing, Dermott makes his way into the center circle. Grace joins in, and they finish in tuneful harmonic thirds. *He sent his luh-uh-uhve . . . on the wings of a dove.* Meanwhile, they draw closer—this could be the finale of a corny musical comedy. Grace smiles warmly, welcomingly, extending her upraised hand, which Dermott takes to make an upside-down vee above their heads. Clapping hands, beaming, they face the crowd like a cheesy showbiz couple after a big duet. And why not? Dermott has saved Grace’s ass; she can exit the limelight without trailing a slimy shadow of humiliation and shame. Marlise is so impressed by Dermott’s rescuing Grace that she decides he must be nicer, and braver,

than she thought. Marlise hopes that this clear rush of respect for Dermott won't get muddled and make her start wanting him all over again.

Everyone's watching Dermott; he's about to recite a poem. Please don't let it be one of those English lyrics: the best-loved poems of Marlise's answering machine. Not Wyatt, obviously, but please, not Donne's holy sonnets. Dermott spreads his legs, plants his feet, and crosses his arms on his chest in the vaguely salacious posture of a satyr in a painting.

That was Dermott's stance when he got out of bed and stood naked at his window, instantly transforming the scene into a Hopper canvas, or some clichéd rendering of male postcoital grief, while Marlise watched from the bed, knowing how stupid she'd been to let herself be changed from a prized object of pursuit into something to be fled from. Maybe she'd been spoiled by working at a place where men paid money to look at her. What had she done wrong? Revealed that she was not the guilty, frigid Irish Catholic lass Dermott liked to imagine?

Plenty of women in this room must have seen Dermott stand like that, naked. Probably enough to form a band of Bacchae, chase down Mr. Orpheus, and tear him limb from limb. But they'd never get away with it, not in this little world run by men, just like the big world run by—

Slowly Dermott begins: "Who, if I cry out, will hear me among the orders of angels?"

It's Rilke. The first Duino Elegy. How many crowds would recognize it after the very first line? These poets do. They all do, they know it almost by heart; they're a community, after all—a thought that makes Marlise so exultantly happy that she's borne, as if on angel's wings, safely past the twinge of recalling that Dermott was translating Rilke when they were . . . going out.

Dermott continues: "And even if the angel clasped me against his heart . . . and what is beauty but the beginning of terror . . . And whom can we call on for help . . . not angel, not man, even the wild animals know we are not at home in our world . . ." Rilke asks, in Dermott's lovely brogue, "Is it easier for lovers?" And answers, "Lovers are only using each other to escape their own separate griefs."

This silvery thread of truth reaches beyond the sordid story of Marlise and Dermott, coils back to Rilke, and spins out to the universe of angels and wild beasts and, as Rilke says, the star waiting for you to notice it; the violin calling you from the past, from an open window; the distraction of expectation; the siren dirge of abandoned women, *enviable* because their passion is so much stronger and purer—

Dermott is an expert on that! But again Marlise is forcibly separated from her private resentments and vacuumed back into the poem, into Rilke telling his terrified heart to listen as the saints have listened, not for the unendurable voice of God but for the voice of the wind as it rises to that place of no longer desiring what one desired, above the living and the

dead, where angels no longer distinguish between the living and the dead.

The poets know what is coming next: the final part of the poem. And they all realize, a good ten lines ahead, that it could have been written expressly for Sydney.

Slowly, tenderly, Dermott recites: "In the end they no longer need us, the ones who are taken early, gently weaned from the earth's sorrows and joys, like children weaned from the breasts of their mothers, and the notes of the song have pierced the empty sensationless void, the first sweet notes of poetry that transfix and comfort and help us . . ."

Marlise has the strangest feeling! It begins inside her chest, with her heart doing that trippy midair rhumba it does when she has drunk too much coffee. But it's not her heart this time. It's her . . . spirit, whooshing out of her eyes and ears, ascending toward the roof of the church, where it pauses to look lovingly down on the mourners while flitting among the white rafters like . . . who was the levitating saint? Saint Joseph of Cupertino—the saint who flew through the air at mass and buzzed his fellow monks at mealtimes and disturbed the whole monastery with his flapping and crowing. Marlise wants to write a poem about him flying or pretending to fly while actually being supported by an angel's invisible arms—a subject she's learning about as she is lifted through the roof of the church and up into the air.

Something unseen is holding her, sailing her aloft through the clouds and all the way back to Northampton. No need to beg Spencer for a ride, no need to worry about her car or the missing keys. She sees her car beneath her as she flies over the rest stop, sees it and wishes it all the best. Dear friend, lost forever! She rides upon an angel's wings, which sandwich her between them, rumbling like a pressure change in her middle ear.

And now the angel is flying Marlise in through her own window and gently depositing her at her writing desk. From above Marlise sees herself scribbling notes for a poem about levitation and Saint Joseph of Cupertino. She smells her neighbor's cigarettes and his wife's herbal tea, sees her study covered by the clothes she tossed everywhere in her struggle to dress this morning.

Then gradually the room empties. All of it starts to vanish—the smell of smoke, of tea. The poster of the Brassai lovers peels away from the wall. Someone must be paying the bills: one by one they're flying off the stack, streaming into the mail. Her clothes are flying, each blouse and skirt onto its own hanger. An unseen hand whisks away the shrouds of discarded clothing piece by piece, slipping them off her notebooks, her chair, the desk at which she writes. The faces of those objects reveal themselves for an instant, and then there are no notebooks, no desk, and now Marlise loses sight of herself, for she has left the room in which there is nothing—nothing but the thrumming of wings galloping through her like blood. ☞

The Lessons of ValuJet 592

by WILLIAM LANGEWIESCHE

As a reconstruction of this terrible crash suggests, in complex systems some accidents may be “normal”—and trying to prevent them all could even make operations more dangerous

ON a muggy May afternoon in 1996 an emergency dispatcher in southern Florida got a call from a man on a cellular phone. The caller said, “Yes. I am fishing at Everglades Holiday Park, and a large jet aircraft has just crashed out here. Large. Like airliner-size.”

The dispatcher said, “Wait a minute. Everglades Park?”

“Everglades Holiday Park, along canal L-sixty-seven. You need to get your choppers in the air. I’m a pilot. I have a GPS. I’ll give you coordinates.”

“Okay, sir. What kind of plane did you say? Is it a large plane?”

“A large aircraft similar to a seven-twenty-seven or a umm . . . I can’t think of it.”

This lapse was unimportant. The caller was a born accident observer—a computer engineer and a private pilot with pride in his technical competence and a passion for detail. His name was Walton Little. When he first saw the airplane, it was banked steeply to the right and flying low, just above the swamp. Later he filed an official report, in which he stated,

There was no smoke, no strange engine noise, no debris in the air, no dangling materials or control surfaces, no apparent deformation of the airframe, and no areas that appeared to have missing panels or surfaces. . . . Sunlight was shining on the aircraft, and some surfaces were more reflective and some less reflective. I saw a difference in reflection of the wing skin in the area where I would expect the ailerons to be, as though they were not neutral. In particular, the lower (outboard) portion of the right wing appeared less reflective as though the aileron was deflected upward.

Nearby fishermen ducked into their boat for cover—but not Walton Little, who stood on his deck, facing “about 115 degrees,” and watched the airplane hit the water. The shock wave passed through his body.

I was in disbelief that the crash had occurred. I stood there for just a moment to consider that it really did happen. I was already thinking that I needed to get my cellular phone out of the storage compartment and call 911, but I wanted to assure myself of what I was doing because it is against the law to make false calls to 911.

He called within a minute. After telling the dispatcher about the crash and reading off his latitude and longitude, he said, “I’m in a bass boat on the canal. I thought it was an aircraft from an air show or something, and . . .”

The dispatcher interrupted. “What did you . . . Did you see flames and stuff come up, sir?”

“I heard the impact, and I saw dirt and mud fly in the air. The plane was sideways before it went out of my sight on the horizon about a mile from me.”

“Yes, sir. Okay. You said it looked like a seven-twenty-seven that went down?”

“Uh, it’s that type aircraft. It has twin engines in the rear. It is larger than an executive jet, like a Learjet.”

“Yes, sir.”

“It’s much bigger than that. I won’t tell you it’s a seven-twenty-seven, but it’s that type aircraft. No engines on the wing, two engines in the rear. I do not see any smoke, but I saw a tremendous cloud of mud and dirt go into the sky when it hit.”

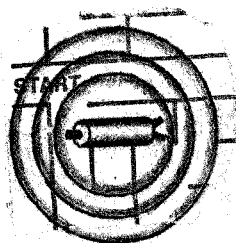
“Okay, sir.”

“It was white with blue trim.”

“White with blue trim, sir?”

“It will not be in one piece.”

Walton Little was right. The airplane was a twin-engine DC-9 painted the colors of ValuJet, an aggressive young discount airline based in Atlanta. When it hit the Everglades, it was banked vertically to the right and pointed nearly straight down. The airplane did not sink mysteriously into the



swamp, as reports later suggested, but shattered as it hit the surface with the furious force of a fast dive.

By the time Walton Little felt the shock wave, everyone aboard was dead—two pilots, three flight attendants, and 105 passengers. Their remains lay in a shallow, watery crater filled with liquid mud and grass. All that marked the surface was a fractured engine, a few dead fish, some jet fuel, and a scattering of personal papers, clothes, and twisted pieces of aluminum—the stuff of tragedy. During those first few days some officials worried aloud about the accident's effect on nature, but the swamp was not so fragile as that, and quickly resumed its usual life. The families of those who died have proved less resilient. Most will feel the poison forever.

For the rest of us, though, the accident should be finished business. The official investigation is over, a "cause" has been found, contributing factors have been acknowledged, and the Federal Aviation Administration has written new regulations. Editorialists have expressed their outrage, and individuals have been held responsible. After a long suspension ValuJet has returned to the air with a renewed commitment to safety. Other airlines, too, have promised to be more careful. And even the FAA has gone through a housecleaning. So by conventional standards the reaction to the tragedy has been admirable. And yes, we know anyway that flying is almost always safe. After years as a working pilot, I have a poetic idea of why: airplanes are fundamentally at home in the sky. Certainly my own experience is that passengers do not need to cower around the exit rows, or carry emergency "smoke hoods," or fear bad weather, or worry about some impending collapse of airline safety. Those are ideas promoted by aviation illiterates—overly cautious people who can always find an audience, and who would smother us in their fear of violent death. The public has the sense in the long run to ignore them. Nonetheless, the ValuJet accident continues to raise troubling questions—no longer about what happened but about why it happened, and what is to keep something similar from happening in the future. As these questions lead into the complicated and human core of flight safety, they become increasingly difficult to answer.

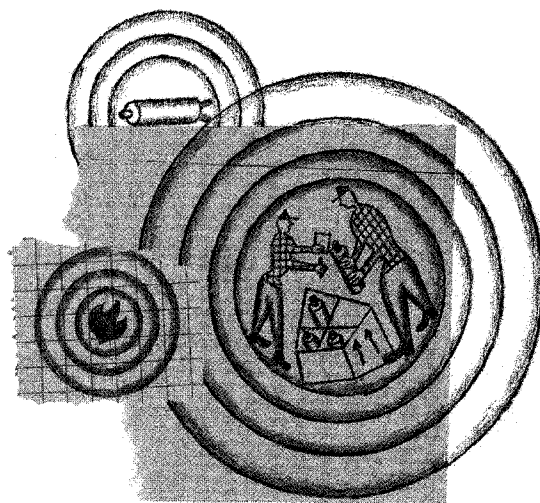
Consider, for simplicity, that there are three kinds of airplane accidents. The most common ones might be called "procedural." They are those old-fashioned accidents that result from single obvious mistakes, that can immediately be

understood in simple terms, and that have simple resolutions. To avoid such accidents pilots must not fly into violent thunderstorms, or take off with ice on their wings, or descend prematurely, or let fear or boredom gain the upper hand. Mechanics, ramp agents, and air-traffic controllers must observe equally simple rules. As practitioners, we have together learned many painful lessons.

The second kind of accident could be called "engineered." It consists of those surprising materials failures that should have been predicted by designers or discovered by test pilots but were not. Such failures at first defy understanding, but ultimately they yield to examination and result in tangible solutions. An American Eagle ATR turboprop dives into a frozen field in Roselawn, Indiana, because its de-icing boots did not protect its wings from freezing rain—and as a result new boots are designed, and the entire testing process undergoes review. A USAir Boeing 737 crashes near Pittsburgh because of a rare hard-over rudder movement—and as a result a redesigned rudder-control mechanism will be installed on the whole fleet. A TWA Boeing 747 blows apart off New York because, whatever the source of ignition, its nearly empty center tank contained an explosive mixture of fuel and air—and as a result explosive mixtures may in the future be avoided.

Such tragic failures seem all too familiar, but in fact they are rare, and they will grow rarer still as aeronautical engineering improves. One can regret the lives lost and deplore the slowness with which officials respond, but in the long run there is reason to be optimistic. The Wright brothers were products of the Enlightenment. Our science will prevail.

The ValuJet accident is different. I would argue that it represents the third and most elusive kind of disaster, a "system accident," which may lie beyond the reach of conventional solution, and which a small group of thinkers, inspired by the Yale sociologist Charles Perrow, has been exploring elsewhere—for example, in power generation, chemical manufacturing, nuclear-weapons control, and space flight. Perrow has coined the more loaded term "normal accident" for such disasters, because he believes that they are normal for our time. His point is that these accidents are science's illegitimate children, bastards born of the confusion that lies within the complex organizations with which we manage our dangerous technologies. Perrow is not an expert on commercial flying, but his think-



ing applies to it nonetheless. In this case the organization includes not only ValuJet, the archetype of new-style airlines, but also the contractors that serve it and the government entities that, despite economic deregulation, are expected to oversee it. Taken as a whole, the airline system is complex indeed.

Keep in mind that it is also competitive, and that if one of its purposes is to make money, the other is to move the public through thin air cheaply and at high speed. Safety is never first, and it never will be, but for obvious reasons it is a necessary part of the venture. Risk is a part too, but on the everyday level of practical compromises and small decisions—the building blocks of this ambitious enterprise—the view of risk is usually obscured. The people involved do not consciously trade safety for money or convenience, but they inevitably make a lot of bad little choices. They get away with those choices because, as Perrow says, Murphy's Law is wrong—what *can* go wrong usually goes *right*. But then one day a few of the bad little choices come together, and circumstances take an airplane down. Who, then, is really to blame?

We can find fault among those directly involved—and we probably need to. But if our purpose is to attack the roots of such an accident, we may find them so entwined with the system that they are impossible to extract without toppling the whole structure. In the case of ValuJet the study of system accidents presents us with the possibility that we have come to depend on flight, that unless we are willing to end our affordable airline system as we know it, we cannot stop the occasional sacrifice. Beyond the questions of blame, it requires us to consider that our solutions, by adding to the complexity and obscurity of the airline business, may actually increase the risk of accidents. System-accident thinking does not demand that we accept our fate without a struggle, but it serves as an important caution.

“Smoke in the Cockpit”

THE distinction among procedural, engineered, and system accidents is of course not absolute. Most accidents are a bit of each. And even in the most extreme cases of system failure the post-crash investigation must work its way forward conventionally, usefully identifying those problems that can be fixed, before the remaining questions begin to force a still-deeper examination. That was certainly the way with ValuJet Flight 592.

It was headed from Miami to Atlanta, flown by Captain Candalyn Kubeck, age thirty-five, and her copilot Richard Hazen, age fifty-two. They represented a new kind of commercial pilot, experienced not only in the cockpit but in the rough-and-tumble of the deregulated airline industry, where both had held a number of low-paid flying jobs before settling on ValuJet. It would have been no shock to them that

ValuJet pilots were non-unionized, or that the company required them to pay for their own training. With 9,000 flight hours behind her, more than 2,000 of them in a DC-9, Kubeck earned what the free market said she was worth—about \$43,000 a year, plus bonuses. Hazen, formerly in the Air Force and with similar experience, earned a bit more than half as much.

Pilots were not the only low-paid employees at ValuJet—flight attendants, ramp agents, and mechanics made a lot less there than they would have at a more traditional airline. So much work was farmed out to temporary employees and independent contractors that ValuJet was sometimes called a “virtual airline.” FAA regulators had begun to worry that the company was moving too fast, and not keeping up with its paperwork, but there was no evidence that the people involved were inadequate. Many of the pilots were refugees from the labor wars at the old Eastern Airlines, and they were generally as competent and experienced as their higher-paid friends at United, American, and Delta. ValuJet was helping the entire industry to understand just how far cost-cutting could be pushed. Its flights were cheap and full, and its stock was strong on Wall Street.

But six minutes out of Miami, while climbing northwest through 11,000 feet, Richard Hazen radioed, “Ah, five-ninety-two needs an immediate return to Miami.” In the deliberate calm of pilot talk this was strong language. The time was thirty-one seconds after 2:10 P.M., and the sun was shining. Something had gone wrong with the airplane.

The radar controller at Miami Departure answered immediately. Using ValuJet's radio name “Crittter” (for the company's cartoonish logo—a smiling airplane), he gave the flight clearance to turn initially toward the west, away from Miami and conflicting traffic flows, and to begin a descent to the airport. “Crittter five-ninety-two, ah roger, turn left heading two-seven-zero, descend and maintain seven thousand.”

The control
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guaranteed
to occur.

Hazen said, "Two-seven-zero, seven thousand, five-ninety-two."

The controller was Jesse Fisher, age thirty-six, a seven-year veteran, who had twice handled the successful return of an airliner that had lost cabin pressurization. He had worked the night before, and had gone home, fed his cat, and slept well. He felt alert and rested. He said, "What kind of problem are you having?"

Hazen said, "Ah, smoke in the cockpit. Smoke in the cabin." His tone was urgent.

Fisher kept his own tone flat. He said, "Roger." Over his shoulder he called, "I need a supervisor here!"

The supervisor plugged in beside him. On Fisher's radar screen Flight 592 appeared as a little oval and an associated group of numbers, including a readout of its altitude. Fisher noticed that the airplane had not yet started to turn. He gave the pilots another heading, farther to the left, and cleared them down to 5,000 feet.

Aboard the airplane Hazen acknowledged the new heading but misheard the altitude assignment. It didn't matter. Flight 592 was burning, and the situation in the cockpit was rapidly getting out of hand. One minute into the emergency the pilots were still tracking away from Miami, and had not begun their return. Hazen said, "Critter five-ninety-two, we need the, ah, closest airport available."

The transmission was garbled or blocked, or Fisher was distracted by competing voices within the radar room. For whatever reason, he did not hear Hazen's request. When investigators later asked him if in retrospect he would have done anything differently, he admitted that he kept asking himself the same question. Even without hearing Hazen's request he might have suggested some slightly closer airport. But given that the flight's position was only twenty-five miles to the northwest, Miami still seemed like the best choice, because of the emergency equipment there. In any case "Miami" was the request he *had* heard, and he intended to deliver it.

To Hazen he said, "Critter five-ninety-two, they're gonna be standing, standing by for you." He meant the crash crews at Miami. "You can plan Runway One-two. When able, direct to Dolphin now."

Hazen said, "... need radar vectors." His transmission was garbled by loud background noises. Fisher thought he sounded "shaky."

Fisher answered, "Critter five-ninety-two, turn left heading one-four-zero."

Hazen said, "One-four-zero." It was his last coherent response.

The flight had only now begun to move through a gradual left turn. Fisher watched the target on his screen as it tracked through the heading changes: the turn tightened and then

slowed again. With each sweep of the radar beam the altitude readouts showed a gradual descent—8,800, 8,500, 8,100. Two minutes into the crisis Fisher said, "Critter five-ninety-two, keep the turn around, heading ah one-two-zero."

Flight 592 may have tried to respond—someone keyed a microphone without talking.

Fisher said, "Critter five-ninety-two, contact Miami Approach on—correction, no, you just keep on my frequency."

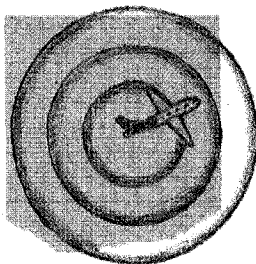
Two and a half minutes had gone by. It was 2:13 P.M. The airplane was passing through 7,500 feet when suddenly it tightened the left turn and entered a steep dive. Fisher's radar showed the turn and an altitude readout of XXX—code for such a rapid altitude change that the computer cannot keep up. Investigators later calculated that the airplane rolled to a sixty-degree left bank and dove 6,400 feet in thirty-two seconds. During that loss of control Fisher radioed mechanically, "Critter five-ninety-two, you can, ah, turn left, heading one-zero-zero, and join the Runway One-two localizer at Miami." He also radioed, "Critter five-ninety-two, descend and maintain three thousand."

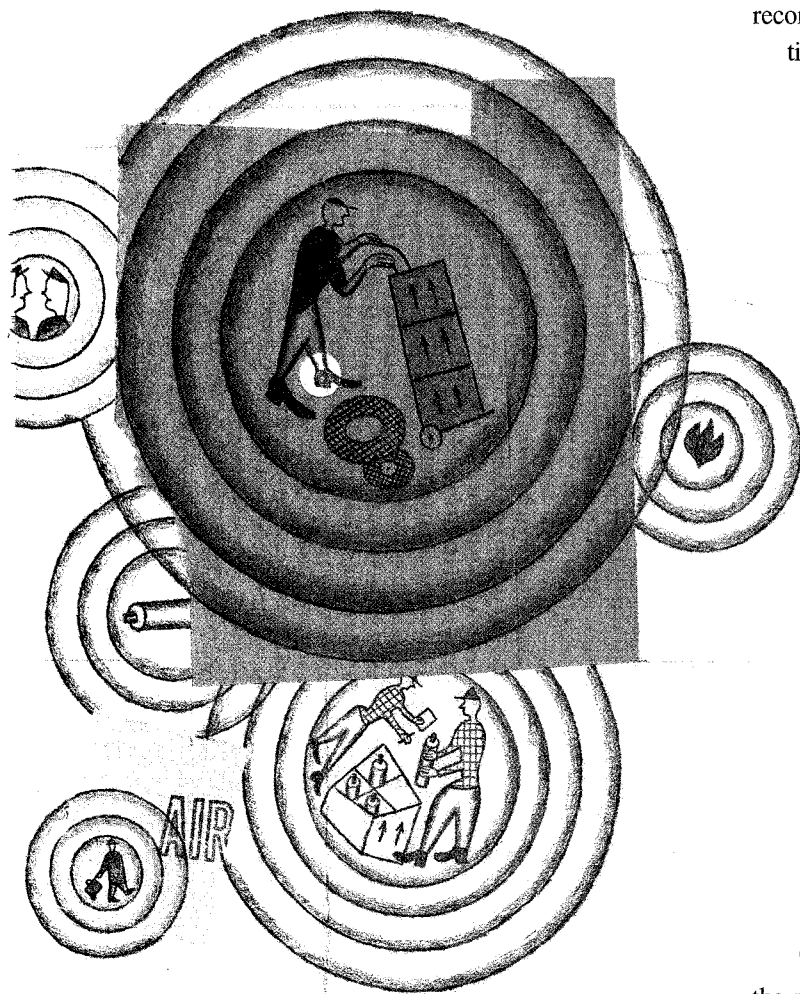
Then the incredible happened. The airplane rolled wings-level again and pulled sharply out of its dive. It is highly unlikely that the airplane would have done this on its own. It is possible that the autopilot kicked in, or that one of the pilots, having been incapacitated by smoke or defeated by melting control cables, somehow momentarily regained control. Fisher watched the radar target straighten toward the southeast, and again read out a nearly level altitude—now, however, merely a thousand feet. The airplane's speed was almost 500 miles an hour.

The frequency crackled with another unintelligible transmission. Shocked into the realization that the airplane would be unable to make Miami, Fisher said, "Critter five-ninety-two, Opa-Locka Airport's about ah twelve o'clock at fifteen miles."

Walton Little, in his bass boat, spotted the airplane then, as it rolled steeply to the right. The radar, too, noticed that last quick turn toward the south, just before the final nose-over. On the next sweep of the radar the flight's data block went into "coast" on Fisher's screen, indicating that contact had been lost. The supervisor marked the spot electronically and launched rescue procedures.

Fisher continued to work the other airplanes in his sector. Five minutes after the impact another low-paid pilot, this one for American Eagle, radioed, "Ah, how did Critter make out?" Fisher didn't answer.





The Recovery Operation

IT was known from the start that fire took the airplane down. The federal investigation began within hours, with the arrival that evening of a National Transportation Safety Board team from Washington. The investigators set up shop in an airport hotel, which they began to refer to as the “command post.” The language is important. As we will see, similar forms of linguistic stiffness, specifically engineerspeak, ultimately proved to have been involved in the downing of Flight 592—and this is a factor that the NTSB investigators, because of their own verbal awkwardness, have been unable quite to recognize.

It is not reasonable to blame them for this, though. The NTSB is a technical agency, staffed by technicians, which occupies a central position in the stilted world of aviation. Its job is to examine important accidents and to issue nonbinding safety recommendations—opinions, really—to industry and government. Because the investigators have no regulatory authority and must rely on persuasion to influence events, it may at times be necessary for them to use official-sounding language. Even among its opponents, who often feel that its

recommendations are impractical, the NTSB has a reputation for technical competence. The NTSB is a piece of engineering done right. In a world built on compromise, it manages to play the old-fashioned, unambiguous role of the public’s defender.

The press plays a more difficult role, though one equally important to the public’s safety. It has a classically symbiotic relationship with the NTSB, relying on the investigators for information while providing them with their only effective voice. Nonetheless, in the time of crisis immediately after an accident, a tension exists between the two. Working under pressure to get the story out, reporters resent the caution of the investigators and their reluctance to speculate anonymously. Working under pressure to get the story right, investigators, for their part, resent the reporters’ incessant demands during the difficult first days of an accident probe—the recovery of human remains and airplane parts. By the time I got to Miami, nineteen hours after Flight 592 hit the swamp, the two camps had assumed their habitual positions and were passing each other warily in the hotel lobby.

Twenty miles to the northwest, deep in the Everglades, the recovery operation was already under way. The NTSB had set up a staging area—a “forward ops base,” one official called it—beside the Tamiami Trail, a two-lane highway that traverses the watery grasslands of southern Florida. Within two days this staging area blossomed into a chaotic encampment of excited officials—local, state, and federal—with their tents and air-conditioned trailers, their helicopters, their cars and flashing lights. I quit counting the agencies. The NTSB had politely excluded most of them from the actual accident site, which lay seven miles north, along a narrow levee road.

The press was excluded even from the staging area, but was provided with two news conferences a day, during which investigators cautiously doled out tidbits of information. One NTSB official said to me, “We’ve got to feed them or we’ll lose control.” But the reporters were well behaved, and if anything a bit overcivilized. Near the staging area they settled into their own little town of television trucks, tents, and lawn chairs. The location gave them good Everglades backdrops and shots of alligators swimming by; the viewing public could not have guessed that they stood so far from the action. They acted impatient, but in truth this was not a bad assignment; at its peak their little town boasted pay phones and pizza delivery.

Maybe it was because of my obvious lack of deadline that the investigators made an exception in my case. They slipped

me into the front seat of a Florida Game and Fish helicopter whose pilot, in a fraternal gesture, invited me to take the controls for the run out to the crash site. From the staging area we skimmed north across the swamped grasslands, loosely following the levee road, before swinging wide to circle over the impact zone—a new pond defined by a ring of turned mud and surrounded by a larger area of grass and water and accident debris. Searchers in white protective suits waded side by side through the muck, piling pieces of people and airplane into flat-bottomed boats. It was hot and unpleasant work performed in a contained little hell, a place that one

investigator later described to me as reeking of fuel, earth, and rotting flesh—the special smell of an airplane accident. We descended onto the levee, about 300 yards away from the crash site, where an American flag and a few tents and trucks constituted the recovery base.

The mood there was quiet and purposeful, with no sign among the workers of the emotional trauma that officials had been worriedly predicting since the operation began. The workers on break sat in the shade of an awning, sipping cold drinks and chatting. They were policemen and firemen, not heroes but straightforward guys accustomed to confronting death. Not knowing who I was, they spoke to me frankly about the gruesome details of their work, and made indelicate jokes, but they seemed

a small-town face and a head of teased hair. A white-suited crew arrived on an airboat and clambered up the embankment to be washed down. Another crew set off. A boatload of muddy wreckage arrived. The next day the families of the dead came on buses, and laid flowers and cried. Pieces of the airplane kept being hauled up for nearly another month.

Much was made of this recovery, which—prior to the offshore retrieval of TWA's Flight 800—the NTSB called the most challenging in its history. It is true that the swamp made the search slow and difficult, and that the violence of the impact meant that meticulous work was required to reconstruct the critical forward cargo hold. However, it is also true that the physical part of the investigation served to confirm what a look at a shipping ticket had already suggested—that ValuJet Flight 592 burned and crashed not because the airplane failed but, in large part, because the airline did.

To me as a pilot, the most impressive aspect of the investigation was the speed with which it worked through the false pursuit of an electrical fire—an explanation supported by my own experiences in flight, and all the more plausible here because the ValuJet DC-9 was old and had experienced a variety of electrical failures earlier the same day, including a tripped circuit breaker that had resisted the attentions of a mechanic in Atlanta, and then mysteriously had fixed itself. I was impressed also by the instincts of the reporters, who for all their technical ignorance seized on the news that Flight 592 had been loaded with a potentially dangerous cargo of chemical oxygen generators—more than a hundred little firebombs that could have caused this accident, and that indeed did.

Flight 592 crashed on a Saturday afternoon. By Sunday the recovery teams were pulling up scorched and soot-stained pieces. On Monday a searcher happened to step on the flight-data recorder, one of two required black boxes meant to help with accident investigations. The NTSB took the recorder to its Washington laboratory and found that a blip in the flight data six minutes after Flight 592's take-off seemed to indicate a momentary rise in air pressure. Immediately afterward the recorder began to fail intermittently, apparently because of electrical-power interruptions. On Tuesday night, at a press conference at the hotel, Robert Francis, the vice-chairman of the NTSB and the senior official on the scene, announced in a monotone, "There could have been an explosion." A hazardous-materials team would be joining the investigation. The investigation was focusing on the airplane's forward cargo hold, which was located just below and behind the cockpit, and was unequipped with fire detection and extinguishing systems. Routine paperwork indicated that the Miami ground crew had loaded the hold with homeward-bound ValuJet "company material," a witch's brew of three tires—at least two of them mounted—and five cardboard boxes of old oxygen generators.

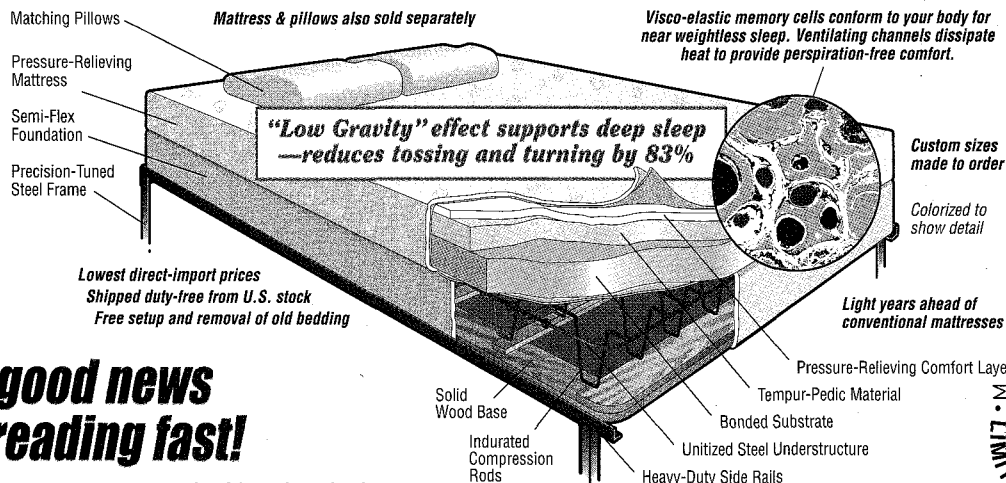
Flight 592
burned be-
cause of its
cargo of
oxygen
generators,
but more
fundamentally
because of a
tangle of con-
fusions that
will take some
entirely dif-
ferent form
next time.

more worried about dehydration than about "taking the job home" or losing sleep. I relaxed in their company, relieved to have escaped for a while the expectation of grief.

It was, of course, a somber place to be. Human remains lay bagged in a refrigerated truck for later transport to the morgue. A decontamination crew washed down torn and twisted pieces of airplane, none longer than several feet. Investigators tagged the most promising wreckage, to be trucked immediately to a hangar at an outlying Miami airport, where specialists could study it. Farther down the levee I came upon a soiled photograph of a young woman with

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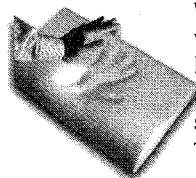
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Inferno in the Air

OXYGEN generators are safety devices. They are small steel canisters mounted in airplane ceilings and seat-backs and linked to the flimsy oxygen masks that dangle in front of passengers when a cabin loses pressurization. To activate oxygen flow the passenger pulls a lanyard, which slides a retaining pin from a spring-loaded hammer, which falls on a minute explosive charge, which sparks a chemical reaction that liberates the oxygen within the sodium-chlorate core. This reaction produces heat, which may cause the surface temperature of the canister to rise to 500° Fahrenheit if the canister is mounted correctly in a ventilated bracket, and much higher if it is sealed in a box with other canisters, which may themselves be heating up. If there is a good source of fuel nearby, such as tires and cardboard boxes, the presence of pure oxygen will cause the canisters to burn ferociously. Was there an explosion on Flight 592? Perhaps. But in any event the airplane was blowtorched into the ground.

It is ironic that the airplane's own emergency-oxygen system was different—a set of simple oxygen tanks, similar to those used in hospitals, that do not emit heat during use. The oxygen generators in Flight 592's forward cargo hold came from three MD-80s, a more modern kind of twin jet, which ValuJet had recently bought and was having refurbished at a hangar across the airport in Miami. As was its practice for most maintenance, ValuJet had hired an outside company to do the job—in this case a large firm called SabreTech, owned by Sabreliner, of St. Louis, and licensed by the FAA to perform the often critical work. SabreTech, in turn, hired contract mechanics from other companies on an as-needed basis. It later turned out that three fourths of the people on the project were just such temporary outsiders. The vulnerability of American wageworkers could be sensed in their testimony after the accident. They inhabited a world of boss men and sudden firings, with few protections or guarantees for the future. As the ValuJet deadline approached, they worked in shifts, day and night, and sometimes through the weekend as well. It was their contribution to our cheap flying.

We will never know everyone at fault in this story. ValuJet gave the order to replace oxygen generators on the MD-80s, most of which had come to the end of their licensed lifetimes. It provided SabreTech with explicit removal procedures and general warnings about the dangers of fire. Over several weeks SabreTech workers extracted the generators and taped or cut off their lanyards before stacking most of them in five cardboard boxes that happened to be lying around the hangar. Apparently they be-

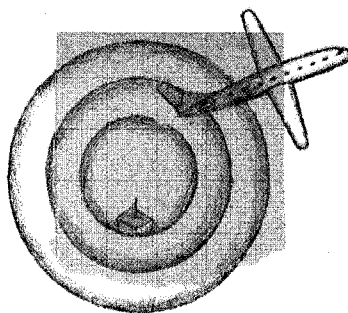
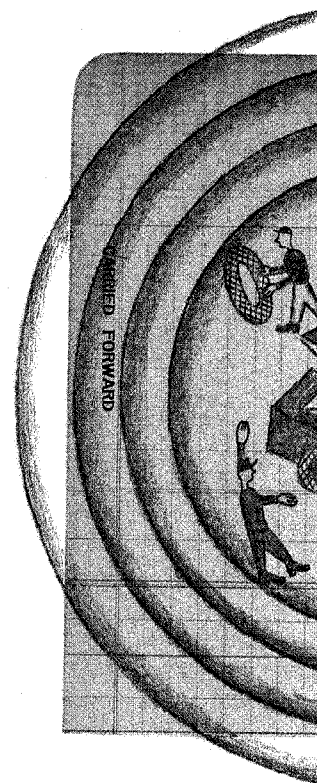
lieved that securing the lanyards would keep the generators from being fired inadvertently. What they did not do was place the required plastic safety caps over the firing pins—a precaution spelled out on the second line of ValuJet's written work order. The problem for SabreTech was that no one had such caps, or cared much about finding them. Ultimately the caps were forgotten or ignored. At the end of the job, in the rush to complete batches of paperwork on all three MD-80s, two mechanics routinely "pencil-whipped" the problem by signing off on the safety-cap line as well as on the others, certifying that the work had been done. SabreTech inspectors and supervisors signed off on the work too, apparently without giving the caps much thought.

The timing is not clear. For weeks the five boxes stood on a parts rack beside the airplanes. Eventually mechanics lugged them over to SabreTech's shipping-and-receiving department, where they sat on the floor in the area designated for ValuJet property. A few days before the accident a SabreTech manager told the shipping clerk to clean up the area and get all the boxes off the floor in preparation for an

upcoming inspection by Continental Airlines,

a potential customer. The boxes were unmarked, and the manager did not care what was in them.

The shipping clerk then did what shipping clerks do, and prepared to send the oxygen generators home to ValuJet headquarters, in Atlanta. He redistributed them equally among the five boxes, laying the canisters horizontally end to end, and packing bubble wrap on top. After sealing the boxes he applied address labels and ValuJet company-material stickers, and wrote "aircraft parts." As part of the load he included two large main tires and a smaller nose tire—at least two of which were



mounted on wheels. The next day he asked a co-worker, the receiving clerk, to make out a shipping ticket, and to write "oxygen canisters—empty" on it. The receiving clerk wrote "Oxy Canisters" and then put "Empty" between quotation

marks, as if he did not believe it. He also listed the tires. The cargo stood for another day or two, until May 11, when the SabreTech driver had time to deliver the boxes across the airport to Flight 592. There the ValuJet ramp agent accepted the material, though federal regulations forbade him to, even if the generators were empty, since canisters that have been discharged contain a toxic residue, and ValuJet was not licensed to carry any such officially designated hazardous materials. He discussed the cargo's weight with the copilot, Richard Hazen, who also should have known better. Together they decided to place the load in the forward hold, where ValuJet workers laid one of the big

main tires flat, placed the nose tire at the center of it, and stacked the five boxes on top of it around the outer edge, in a loose ring. They leaned the other main tire against a bulkhead. It was an unstable arrangement. No one knows exactly what happened then, but it seems likely that the first oxygen generator ignited during the loading or during taxiing or on takeoff, as the airplane climbed skyward.

Two weeks later and halfway through the recovery of the scorched and shattered parts a worker finally found the airplane's cockpit voice recorder, the second black box sought by the investigators. It had recorded normal sounds and conversation up to the moment—six minutes after takeoff—when the flight-data recorder indicated a pulse of high pressure. The pulse may have been one of the tires exploding. In the cockpit it sounded like a chirp and a simultaneous beep on the public-address system. The captain, Candalyn Kubeck, asked, "What was that?"

Hazen said, "I don't know."

They scanned the airplane's instruments and found sudden indications of electrical failure. It was not the cause but a symptom of the inferno in the hold—the wires and electrical panels were probably melting and burning along with other, more crucial parts of the airplane—but the pilots' first thought was that the airplane was merely up to its circuit-breaking tricks again. The recording here is garbled. Kubeck seems to have asked, "About to lose a bus?" Then, more clearly, she said, "We've got some electrical problem."

Hazen said, "Yeah. That battery charger's kickin' in. Oooh, we gotta . . ."

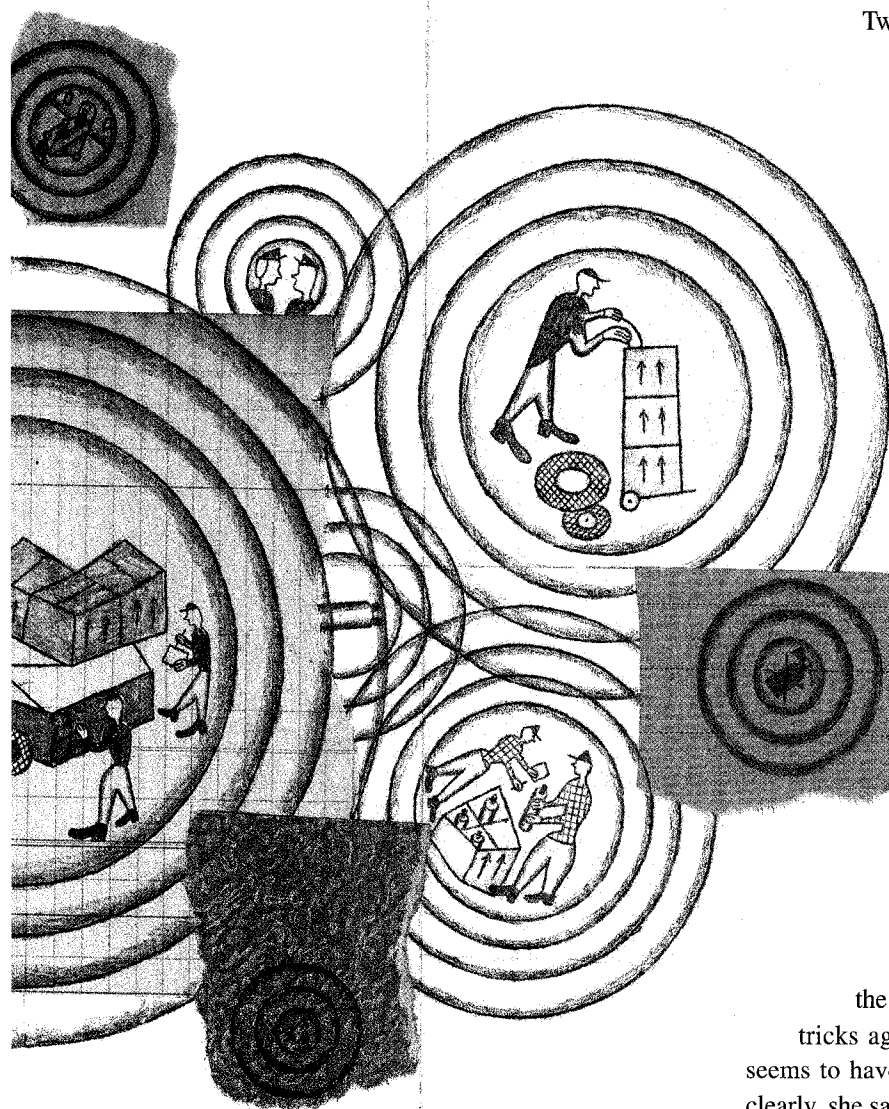
"We're losing everything," Kubeck said. "We need, we need to go back to Miami."

Twenty seconds had passed since the strange chirp in the cockpit. A total electrical failure, though serious, was not in those sunny conditions a life-threatening emergency. But suddenly there was incoherent shouting from the passenger cabin, and women and men screaming, "Fire!" The shouting continued for thirteen seconds and then subsided.

Kubeck said, "To Miami," and Hazen put in the call to Jesse Fisher, the air-traffic controller. When Fisher asked, "What kind of problem are you having?" Kubeck answered, off-radio, "Fire," and Hazen transmitted his urgent "Smoke in the cockpit. Smoke in the cabin."

marks, as if he did not believe it. He also listed the tires.

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Investigators now presume that the smoke was black and thick, and perhaps poisonous. The recorder picked up the sound of the cockpit door opening, and the voice of the chief flight attendant, who said, "Okay, we need oxygen. We can't get oxygen back there." Did she mean that the airplane's cabin masks had not dropped, or that they had dropped but were not working? If the smoke was poisonous, the masks might not have helped much, since by design they mix cabin air into the oxygen flow. The pilots were equipped with better, isolating-type masks and with goggles, but may not have had time to put them on. Only a minute had passed since the first strange chirp. Now the voice recorder captured the sound of renewed shouting from the cabin. In the cockpit the flight attendant said, "Completely on fire."

The recording was of little use to the NTSB's technical investigation, but because it showed that the passengers had died in agony, it added emotional weight to a political reaction that was already spreading beyond the details of the accident and that had begun to call the entire airline industry into question. The public, it seemed, would not be placated this time by standard reassurances and the discovery of a culprit or two. The press and the NTSB had put aside their on-site antagonism and had joined forces in a natural coalition with Congress. The questioning was motivated not by an immediate fear of unsafe skies (despite the warnings of Mary Schiavo, a federal whistle-blower who claimed special insight) but rather by a more nuanced suspicion that competition in the open sky had gone too far, and that the FAA, the agency charged with protecting the flying public, had fallen into the hands of industry insiders.

The Hunt for Blame

THE FAA's administrator then was a onetime airline boss named David Hinson—the sort of glib and self-assured executive who does well in closed circles of like-minded men. Now, however, he would have to address a diverse and skeptical audience. The day after the ValuJet accident he had flown to Miami and made the incredible assertion that ValuJet was a safe airline—when for 110 people lying dead in a nearby swamp it very obviously was not. He also said, "I would fly on it," as if he believed that he had to reassure a nation of children. It was an insulting performance, and it was taken as evidence of the FAA's isolation and of its betrayal of the public's trust.

After a good night's sleep Hinson might have tried to repair the damage. Instead he appeared two days later at a Senate hearing in Washington sounding like an unrepentant Prussian: "We have a very professional, highly dedicated, organized, and efficient inspector work force that do their job day in and day out. And when we say an airline is safe to fly, it is safe to fly. There is no gray area."

His colleagues must have winced. Aviation safety is noth-

ing but a gray area, and the regulation of it is an indirect process of negotiation and maneuver. Consider the size of the airline business, the scale of the sky, and the loneliness of an airplane in flight. The FAA can affect safety by establishing standards and enforcing them through inspections and paperwork, but it cannot throw the switches or turn the wrenches, or in this case supervise the disposal of old oxygen generators. Safety is ultimately in the hands of the operators, the mechanics and pilots and their managers, because it involves a blizzard of small judgments. Hinson might have admitted this reality to the American public, which is certainly capable of understanding such subtleties, but instead, inexplicably, he chose to link the FAA's reputation to that of ValuJet. This placed the agency in an impossible position. Whether for incompetence or for cronyism, the FAA would now inevitably be blamed.

Within days it came out that certain inspectors at the FAA had been worried about ValuJet for some time and had described their concerns in their reports. Their consensus was that the airline was expanding too fast (from two to fifty-two airplanes over its two-and-a-half-year life) and that it had neither the procedures nor the people in place to maintain standards of safety. The FAA tried to keep pace, but because of its other commitments—including countering the threat of terrorism—it could assign

only three inspectors to the airline. At the time of the accident they had run 1,471 routine checks on the operation and made two additional eleven-day inspections, in 1994 and 1995. This level of scrutiny was about normal. But by early 1996 concern had grown within the FAA about the disproportionate number of infractions committed by ValuJet and the string of small bang-ups it had had. The agency began to move more aggressively. An aircraft-maintenance group found such serious problems in both the FAA's surveillance and the airline's operations that it wrote an internal report recommending that ValuJet be "recertified" immediately—



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stiffness
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meaning that it be grounded and started all over again. The report was apparently sent to Washington, where for reasons that remain unexplained it lay buried until after the accident. Meanwhile, on February 22, 1996, headquarters launched a 120-day "special emphasis" inspection, a preliminary report on which was issued after the first week. This suggested a wide range of problems. The special-emphasis inspection was ongoing when, on May 11, Flight 592 went down.

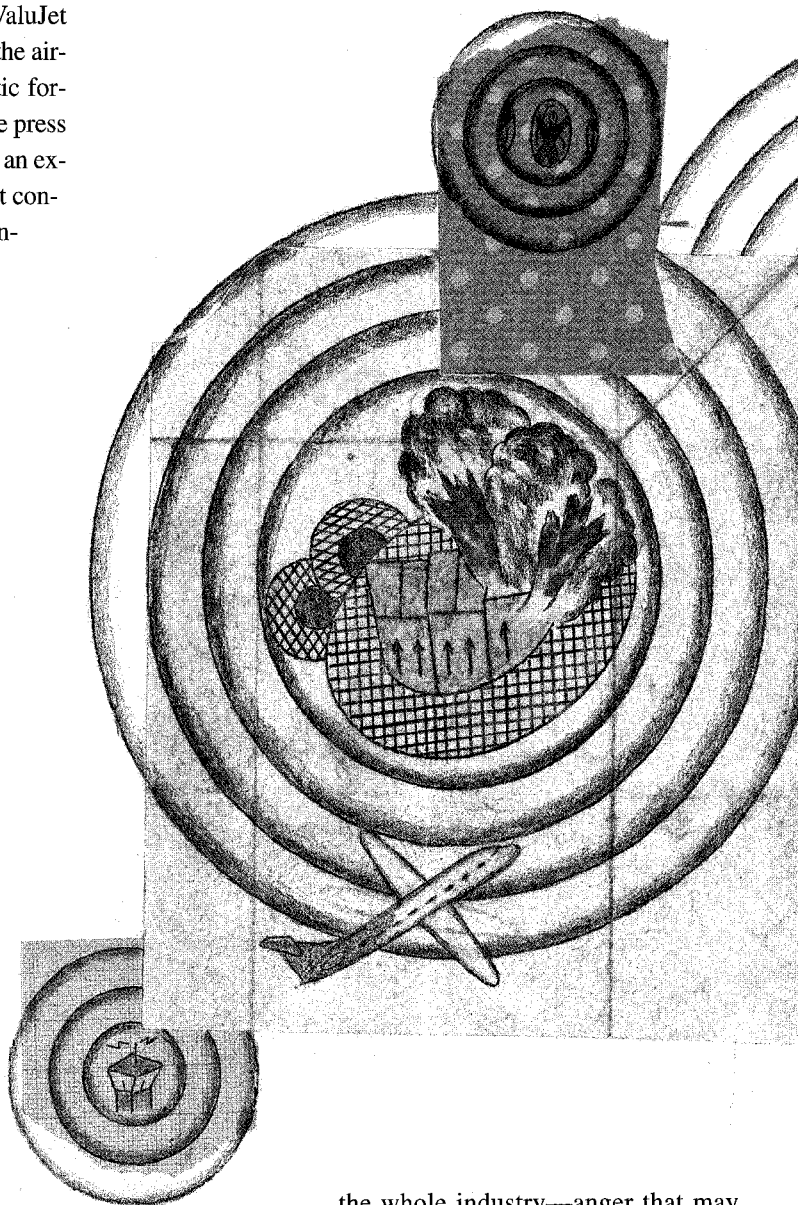
As this record of official concern emerged, the question changed from why Hinson had insisted on calling ValuJet "safe" after the accident to why he had not shut down the airline before the accident. Trapped by his own simplistic formulations, he could provide no convincing answer. The press and Congress were sharply critical. The FAA launched an exhaustive thirty-day review of ValuJet, perhaps the most concentrated airline inspection in history, assigning sixty inspectors to perform in one month the equivalent of four years' work. Lewis Jordan, a founder and the president of ValuJet, complained that Hinson was, in effect, conducting a witch hunt that no airline could withstand. Jordan had been trying shamelessly to shift the blame for the deaths onto his own contractor, SabreTech, and he received little sympathy now. No one was surprised when ValuJet was grounded indefinitely five weeks after the accident.

Here now was proof that the FAA had earlier neglected its duties. The agency's chief regulator, Anthony Broderick, was the first to lose his job. Broderick was an expert technocrat, disliked by safety crusaders because of his conservative approach to instituting and applying regulations, and respected by aviation insiders for the same reason. Hinson let him take the fall: Broderick was a man of integrity and would accept responsibility for the FAA's poor performance. But if Hinson thought that he himself could escape with this sacrifice, he was wrong. Broderick's airline friends now joined the critics in disgust. Hinson announced his upcoming resignation.

In a sense, the system worked. The tragedy did have some positive consequences—primarily because the NTSB did an even better job than usual, not only pinpointing the source and history of the fire but also recognizing some of its larger implications. With a well-timed series of press feedings and public hearings the accident team kept the difficult organizational issues alive and managed to stretch the soul-searching through the end of the year and beyond. By shaking up the FAA, the team reminded the agency of its mandate to oversee the safety of the airlines—perhaps prodding the FAA into a renewed commitment to inspections and a reso-

lution to hold airlines responsible for their actions and for the performance of outside shops.

For the airlines, the investigation served as a necessary reminder of the possible consequences of cost-cutting and complacency. Among airline executives smart enough to notice, it may also have served as a warning about the public's growing distrust of their motives and about widespread anger with



the whole industry—anger that may have as much to do with the way passengers are handled as with their fears of dying.

However one wants to read it, the ValuJet turmoil marked the limits of the public's tolerance. The airlines were cowed, and they submitted eagerly to the banning of oxygen generators as cargo on passenger flights. They then rushed ahead of the FAA with a \$400 million promise (not yet fulfilled) to install fire detectors and extinguishers in all cargo holds. The desire to find hidden hazards runs up against the practical difficulties of inspecting cargo. Nonetheless, ground

crews can be counted on for a while to watch what they load into airplanes and what they take out and throw away.

And the guilty companies? They lost money and were sued, of course. After firing the two mechanics who had falsely signed the work orders, SabreTech tried to put its house in order. Nonetheless, its customers fled and did not return. The Miami operation shrank from 650 to 135 employees, and in January of last

A "Normal Accident"

PILOTS are safety practitioners, steeped in a can-do attitude toward survival and confident in their own skills. We tend to think that man-made accidents must lie within human control. This idea has been encouraged to some extent by the work of a group of Berkeley professors—notably the political scientist Todd La Porte—who study “high-reliability organizations,” meaning those with good track records at handling apparently hazardous technologies: aircraft carriers, air-traffic-control centers, certain power companies. They believe that organizations can learn from past mistakes and can tailor themselves to achieve new objectives, and that if the right, albeit difficult, steps are taken, many accidents can be avoided.

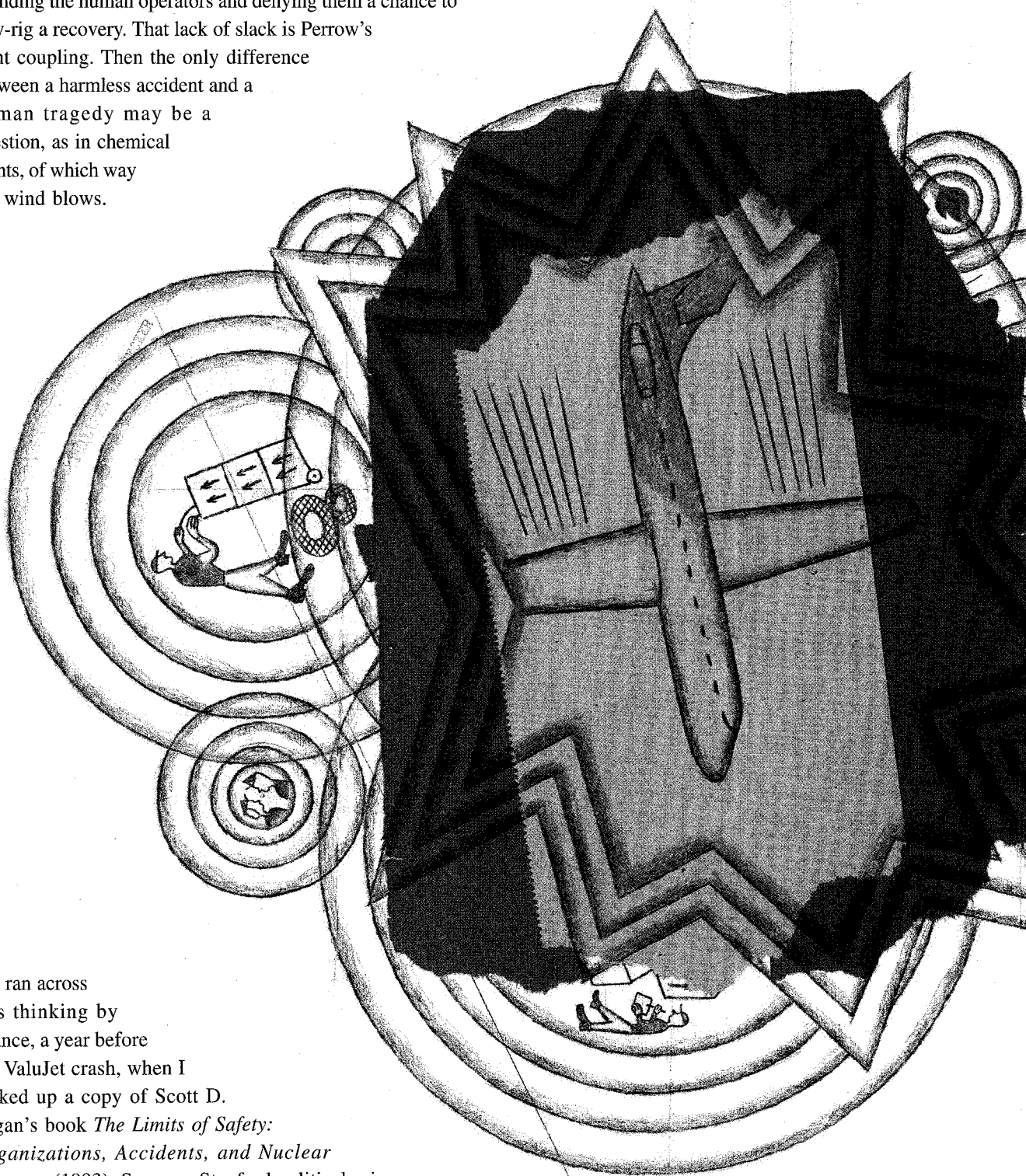
Charles Perrow’s thinking is more difficult for pilots like me to accept. Perrow came unintentionally to his theory about normal accidents after studying the failings of large organizations. His point is not that some technologies are riskier than others, which is obvious, but that the control and operation of some of the riskiest technologies require organizations so complex that serious failures are virtually guaranteed to occur. Those failures will occasionally combine in unforeseeable ways, and if they induce further failures in an operating environment of tightly interrelated processes, the failures will spin out of control, defeating all interventions. The resulting accidents are inevitable, Perrow asserts, because they emerge from the venture itself. You cannot eliminate one without killing the other.

Perrow’s seminal book *Normal Accidents: Living With High-Risk Technologies* (1984) is an unusual work—a hodgepodge of storytelling and exhortation, out of which this new way of thinking has risen. His central device is an organizational chart on which to plot the likelihood of serious system accidents. He does not append numerical values to the chart but uses a set of general risk indicators. In one quadrant stand the processes—like those of most manufacturing—that are simple, slow, linear, and visible, and in which the operators experience failures as isolated and containable events. In the opposite one stand the opaque and tangled processes characterized by a combination of what Perrow calls “interactive complexity” and “tight coupling.” By “interactive complexity” he means not simply that there are many elements involved but that those elements are linked in multiple and often unpredictable ways. The failure of one part—whether material, psychological, or organizational—may coincide with the failure of an entirely different part, and this unforeseeable combination will cause the failure of other parts, and so on. If the system is large, the possible combinations of failures are practically infinite. Such unravelings seem to have an intelligence of their own: they expose hidden connections, neutralize redundancies, bypass “fire-

year was forced to close its doors. Soon afterward, as the result of a two-month FAA investigation, SabreTech’s new Orlando facility was forced to close as well. ValuJet survived its grounding, and under intense FAA scrutiny returned to the sky later in 1996, with a reduced and standardized fleet of DC-9s; it ultimately changed its name to AirTran. For a while it was probably the safest airline in the country. What, then, explains the feeling, particular to this case, that so little has in reality been achieved?

walls,” and exploit chance circumstances that no engineer could have planned for. When the operating system is inherently quick and inflexible (like a chemical process, an automated response to missile attack, or a jet airliner in flight), the cascading failures can accelerate out of control, confounding the human operators and denying them a chance to jury-rig a recovery. That lack of slack is Perrow’s tight coupling. Then the only difference between a harmless accident and a human tragedy may be a question, as in chemical plants, of which way the wind blows.

mal-accident theories in opposition and then tests them against a laboriously researched and previously secret history of failures within U.S. nuclear-weapons programs. The test is a transparent artifice, but it serves to define the two



I ran across this thinking by chance, a year before the ValuJet crash, when I picked up a copy of Scott D. Sagan’s book *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons* (1993). Sagan, a Stanford political scientist who is a generation younger than Perrow, is the most persuasive of Perrow’s interpreters, and with *The Limits of Safety* he has solidified system-accident thinking, focusing it more clearly than Perrow was able to. *The Limits of Safety* starts by placing high-reliability and nor-

theories. Sagan’s obvious bias does not diminish his work. Strategic nuclear weapons pose an especially difficult problem for system-accident thinking, for two reasons: first, there

has never been an accidental nuclear detonation, let alone an accidental nuclear war; and second, if a real possibility of such an apocalyptic failure exists, it threatens the very logic of nuclear deterrence—the expectation of rational behavior on which we continue to base our arsenals. Once again the pursuit of system accidents leads to uncomfortable ends. Sagan is not a man to advocate disarmament, and he shies away from doing so in his book, observing realistically that nuclear weapons are

here to stay. Nonetheless, once he has defined “accidents”

as less than nuclear explosions (as false warnings, near launches, and other unanticipated break-

downs in this ultimate “high-reliability”

system), Sagan discovers a pattern of

accidents, some of which were con-

tained only by chance. The reader

is hardly surprised when Sa-

gan concludes that such ac-

cidents are inevitable.

The book interested me not because of the accidents themselves

but because of their

pattern, which

seemed strangely

familiar. Though

the pattern rep-

resented possi-

bilities that I as

a pilot had cate-

gorically rejected,

this new perspec-

tive required me

to face the unpre-

dictable side of my

own experience with

the sky. I had to admit

that some of my friends

had died in crazy and un-

lucky ways, that some flights

had gone uncontrollably wrong,

and that perhaps not even the pilots

were to blame. What is more, I had to

admit that no matter how carefully I checked

my own airplanes, and how cautiously I flew

them, the same could happen to me.

That is where we stand now as a society with ValuJet Flight 592, and it may explain our continuing discomfort with the accident. The ValuJet case represents a nearly perfect system accident. It arose from a process that fits most of Perrow’s technical requirements of unpredictability and interactive complexity and some of those of tight coupling. More important, it fits the most basic definitions of an accident caused by the very functioning of the system or indus-

try within which it occurred. Flight 592 burned because of its cargo of oxygen generators, yes, but more fundamentally because of a tangle of confusions that will take some entirely different form next time. It is frustrating to fight such a thing, and wrongdoing is difficult to assign.

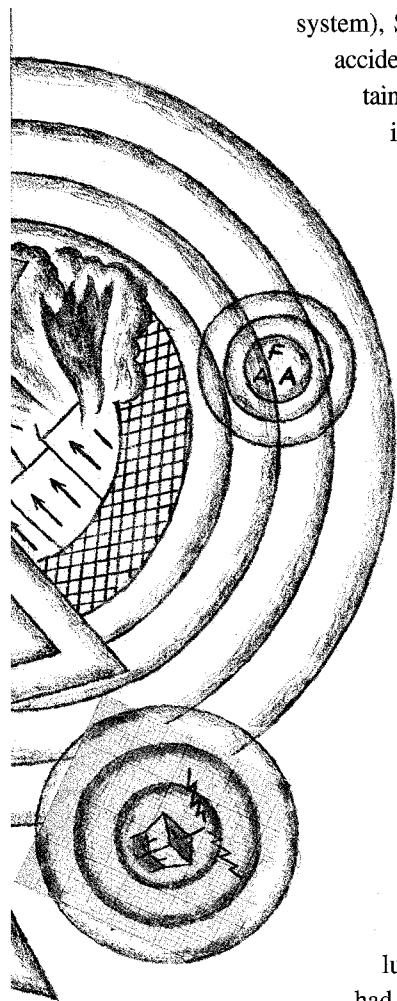
ValuJet’s Pretend Reality

TAKE, for example, the case of the two SabreTech mechanics who helped to remove the oxygen canisters from the ValuJet MD-80s, ignored the written work orders to install safety caps, stacked the dangerous canisters improperly in cardboard boxes, and finished by falsely signing off on the job. They will probably suffer for the rest of their lives for their negligence, as perhaps they should.

But here is what really happened: Nearly 600 people logged time working on the three ValuJet airplanes in SabreTech’s Miami hangar, and of them seventy-two logged 910 hours over several weeks for replacing oxygen generators, in most cases because they had “expired”—reached the end of their approved lives. According to ValuJet work card No. 0069, which was supplied to investigators, the second step of the seven-step removal process was *If generator has not been expended, install shipping cap on firing pin.*

This required a gang of hard-pressed mechanics to draw a verbal distinction between canisters that *were* “expired,” meaning most of the ones they were removing, and canisters that *were not* “expended,” meaning many of the same ones, loaded and ready to fire, on which they were expected to put nonexistent caps. Also involved were canisters that were expired and expended, and others that were not expired but were expended. And then, of course, there was the set of new replacement canisters, which were both unexpired and unexpired. If this seems confusing, do not waste your time trying to figure it out—the SabreTech mechanics did not, nor should they have been expected to. The NTSB suggested that one problem at SabreTech’s Miami facility may have been the presence of Spanish-speaking immigrants on the work force, but quite obviously the language problem lay on the other side—with ValuJet and the English-speaking engineers, literalists, who wrote the orders and technical manuals as if they were writing to themselves. The real problem, in other words, was engineerspeak.

Before the accident the worry was not about old parts but about new ones—the safe refurbishing of the MD-80s in time to meet the ValuJet deadline. The mechanics quickly removed the oxygen canisters from their brackets and wired green tags to most of them. The green tags meant “repairable,” which these canisters were not. It is not clear how many of the seventy-two workers were aware that these canisters couldn’t be used again, since the replacement of oxygen generators is a rare operation, though of the people questioned after the accident most claimed to have known at



least why the canisters had to be removed. But here, too, there is evidence of confusion. After the accident two tagged canisters were found still lying in the SabreTech hangar. On one of the tags, under "Reason for Removal," someone had written, "out of date." On the other tag someone had written, "generators have been ~~expired~~ fired."

Yes, a mechanic might have found his way past the ValuJet work card and into the huge MD-80 maintenance manual, to chapter 35-22-01, within which line "h" would have instructed him to "store or dispose of oxygen generator." By diligently pursuing his options, the mechanic could have found his way to

By adding to the obscurity and complexity of the system, our solutions may aggravate just those characteristics that led to the accidents in the first place.

a different part of the manual and learned that "all serviceable and unserviceable (unexpended) oxygen generators (canisters) are to be stored in an area that ensures that each unit is not exposed to high temperatures or possible damage." By pondering the implications of the parentheses he might have deduced that the "unexpended" canisters were also "unserviceable" canisters and that because he had no shipping cap, he should perhaps take such canisters to a safe area and "initiate" them, according to the procedures described in section 2.D. To initiate an oxygen generator is of course to fire it off, triggering the chemical reaction that produces oxygen and leaves a mildly toxic residue within the canister, which is then classified as hazardous waste. Section 2.D contains the admonition "An expended oxygen

generator (canister) contains both barium oxide and asbestos fibers and must be disposed of in accordance with local regulatory compliances and using authorized procedures." No wonder the mechanics stuck the old generators in boxes.

The supervisors and inspectors failed miserably here, though after the accident they proved clever at ducking responsibility. At the least they should have supplied the required safety caps and verified that those caps were being used. If they had—despite all the other errors that were made—Flight 592 would not have burned. For larger reasons, too, their failure is an essential part of this story. It rep-

resents not the avarice of profit takers but rather something more insidious—the sort of collective relaxation of technical standards that the Boston College sociologist Diane Vaughan has called "the normalization of deviance," and that she believes existed at NASA in the years leading up to the 1986 explosion of the space shuttle *Challenger*. The leaking O-rings that caused the catastrophic blow-by of rocket fuel were a well-known design weakness, and had been the subject of worried memos and conferences up to the eve of the launch. Vaughan's book *The Challenger Launch Decision* (1996) is a 575-page exercise in system-accident thinking. After a long immersion in NASA's technical culture, Vaughan concludes that the O-ring worries were put aside in part because the agency had gotten away with launching the O-rings before. As Perrow has argued, what can go wrong usually goes right—and then people draw the wrong conclusions. In a general way this is what happened at SabreTech. Some mechanics now claim to have expressed their concerns about the safety caps, but if they did, they were not heard. The operation had grown used to taking shortcuts.

But let us be honest—mechanics who are too careful will never get the job done. The airline system as it stands today requires people, in flight or on the ground, to compromise, to make choices, and sometimes even to gamble. The SabreTech crews went astray—but not far astray—by allowing themselves quite naturally not to worry about discarded parts. A fire hazard? Sure. The mechanics taped off the lanyards and may have shoved the canisters a little farther away from the airplanes they were working on. The canisters had no warnings about heat on them and none of the standard hazardous-materials placards. It probably would not have mattered anyway, because the work area was crowded with placards and officially designated hazardous materials, and people had learned not to take them too seriously. Out of curiosity a few of the mechanics fired off some canisters and listened to the oxygen come out—it went *psst*. No one seems to have considered the possibility that the canisters might accidentally be shipped. The mechanics did finally carry the five cardboard boxes over to the shipping department, but only because that was where ValuJet property was stored—an arrangement that itself made sense.

When the shipping clerk got to work the next morning, he found the boxes without explanation on the floor of the ValuJet area. The boxes were innocent-looking, and he left them alone until he was told to tidy up. Sending them to Atlanta seemed like the best way to do that. He had shipped off "company material" before without ValuJet's specific approval, and he had heard no complaints. He knew he was dealing with oxygen canisters, but apparently did not understand the difference between oxygen storage tanks and generators designed to fire off. When he prepared the boxes for shipping, he noticed the green "repairable" tags mistakenly placed on the canisters by the mechanics, and misunderstood them to signi-

fy “unserviceable” or “out of service,” as he variably said after the accident. He also drew the unpredictable conclusion that the canisters were therefore empty. He asked the receiving clerk to fill out a shipping ticket. The receiving clerk did as he was asked, listing the tires and canisters, and put quotation marks around the word “Empty.” Later, when asked why, he replied, “No reason. I always put like, when I put my check, I put ‘Carlos’ in quotations. No reason I put that.” The reason was that it was his habit. On the shipping ticket he also put “5 boxes” between quotation marks.

But a day or so later, over by Flight 592, the ValuJet ramp agent who signed for the cargo didn’t care about such subtleties. ValuJet was not authorized to carry hazardous cargoes of any sort, and it seems obvious now that a shipping ticket listing tires on wheel assemblies and oxygen canisters (whether or not they were empty) should have aroused the ramp agent’s suspicions. No one would have complained had he opened the boxes, or summarily rejected the load. There was no hazardous-materials paperwork associated with it, but he had been formally trained in the recognition of unmarked hazards. His ValuJet station-operations manual specifically warned, “Cargo may be declared under a general description that may have hazards which are not apparent, that the shipper may not be aware of this. You must be conscious of the fact that these items have caused serious incidents, and in fact, endangered the safety of the aircraft and personnel involved.” It also said,

Your responsibility in recognizing hazardous materials is dependent on your ability to: 1. Be Alert! 2. Take the time to ask questions! 3. Look for labels! . . . Ramp agents should be alert whenever handling luggage or boxes. Any item that might be considered hazardous should be brought to the attention of your supervisor or pilot, and brought to the immediate attention of Flight Control and, if required, the FAA. REMEMBER: SAFETY OF PASSENGERS AND FELLOW EMPLOYEES DEPENDS ON YOU!

It is possible that the ramp agent was lulled by the company-material labels. Would the SabreTech workers ship hazardous cargo without letting him know? His conversation with the copilot, Richard Hazen, about the weight of the load may have lulled him as well. Hazen, too, had been formally trained to spot hazardous materials, and he would have understood better than the ramp agent the dangerous nature of oxygen canisters, but he said nothing. It was a routine moment in a routine day. The morning’s pesky electrical problems had perhaps been resolved. The crew was calmly and rationally preparing the airplane for the next

flight, a procedure that had always worked for them before. As a result the passengers’ last line of defense folded. They were unlucky, and the system killed them.

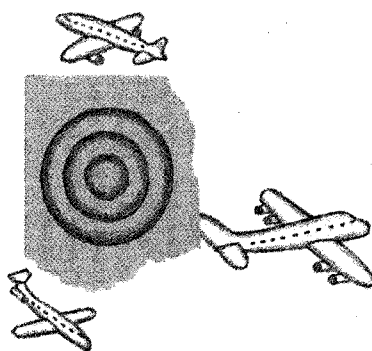
Giving Up on a Zero-Accident Future

WHAT are we to make of this tangle of circumstance and error? One suspicion is that its causes may lie in the market forces of a deregulated airline industry, and that in order to keep such catastrophes from happening in the future we might need to consider the possibility of re-regulation—a return to the old system of limited competition, union work forces, higher salaries, and expensive tickets. There are calls now for just that. The improvement in safety would come from slowing things down, and allowing a few anointed airlines the leisure to discover their mistakes and act on them. The effects on society, however, would be costly and anti-egalitarian—a return to a constricted system that many fewer people could afford to use. Moreover, technical trends would argue against it. Despite the obvious chaos of the business and the apparent frequency of airline accidents, air travel has become safer under deregulation. Reductions in “procedural” and “engineered” accidents have more than compensated for any increase in system accidents—which in any case must have occurred in the past as well.

The other way to regulate the airline industry is not economic but operational—detailed governmental oversight of all the technical aspects of flight. This is an approach we have taken since the birth of the airlines, in the 1920s, and it is what we expect of the FAA today. Strictly applied stan-

dards are all the more important in a free market, in which unchecked competition would eventually require airlines to cut costs to the point of operating unsafely, until accidents forced them out of business one by one. A company should not overload its airplanes or fly them with worn-out parts, but it also cannot compete effectively against other companies that do. Day to day, airline executives may resent the intrusion of government, but in their more reflective moments they must also realize that they need this regulation

in order to survive. The friendship that has grown up between the two sides—between the regulators and the regulated—is an expression of this fact, which no amount of self-reform at the FAA can change. When after the ValuJet crash David Hinson, of the FAA, reacted to accusations of cronyism by going to Congress and humbly requesting that his agency’s “dual mandate” be eliminated, so



that it would no longer be required by law to promote the airlines, he and Congress (which did as he requested) were engaged in a particularly hollow form of political theater.

The FAA's critics had real points to make. The agency had become too worried about the reactions of its allies in the airline industry, and it needed to try harder to enforce existing regulations. Perhaps it needed even to write some new regulations. Like NASA before the *Challenger* accident, the FAA needed to listen to the opinions and worries of its own lower-level employees. But there are limits to all this, too. When, at a post-crash press conference in Miami, a reporter asked Robert Francis, of the NTSB, "Shouldn't the government protect us against this kind of thing?" the best answer would have been "It cannot, and never will."

The truth helps, because in our frustration with such system accidents we may be tempted to invent solutions that, by adding to the obscurity and complexity of the system, may aggravate just those characteristics that led to the accidents in the first place. This argument for a theoretical point of *diminishing* safety is a central part of Perrow's thinking, and it seems to be borne out in practice. In his exploration of the North American early-warning system Sagan found that the failures of safety devices and backup systems gave the most dangerous false indications of missile attack—the kind that could have triggered a response. The radiation accidents at

Chernobyl and Three Mile Island were both induced by failures in the safety systems. Remember also that the ValuJet oxygen generators were safety devices, that they were backup systems, and that they were removed from the MD-80s because of regulations limiting their useful lives. This is not an argument against such devices but a reminder that elaboration comes at a price.

Human reactions add to the problem. Administrators can think up impressive chains of command and control, and impose complex double checks and procedures on an operating system, and they can load the structure with redundancies, but on the receiving end there comes a point—in the privacy of a hangar or a cockpit—beyond which people rebel. These rebellions are now common throughout the airline business—and, indeed, throughout society. They result in unpredictable and arbitrary actions, all the more so because in the modern, insecure workplace they remain undeclared. The one thing that always gets done is the required paperwork.

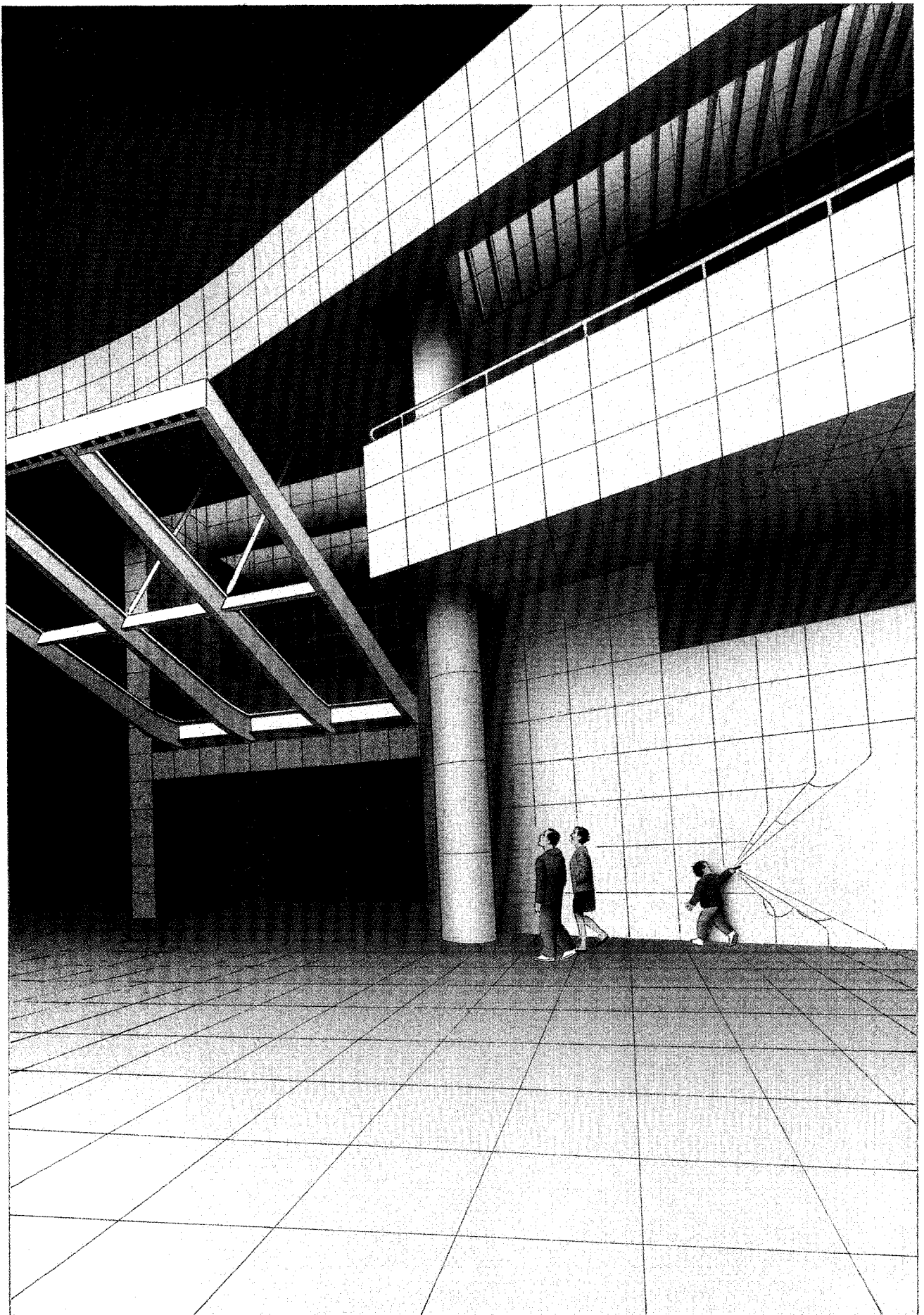
Paperwork is a necessary and inevitable part of the system, but it, too, introduces dangers. The problem is not just the burden that it places on practical operations but also the deception that it breeds. The two unfortunate mechanics who signed off on the nonexistent safety caps just happened to be the slowest to slip away when the supervisors needed signatures. The other mechanics almost certainly would have signed too, as did the inspectors. Their good old-fashioned pencil-whipping is perhaps the most widespread form of Vaughan's "normalization of deviance." The falsification they committed was part of a larger deception—the creation of an entire pretend reality that includes unworkable chains of command, unlearnable training programs, unreadable manuals, and the fiction of regulations, checks, and controls. Such pretend realities extend even into the most self-consciously progressive large organizations, with their attempts to formalize informality, to deregulate the workplace, to share profits and responsibilities, to respect the integrity and initiative of the individual. The systems work in principle, and usually in practice as well, but the two may have little to do with each other. Paperwork floats free of the ground and obscures the murky workplaces where, in the confusion of real life, system accidents are born.

It would be wrong to conclude that we should join the alarmists in their prophesies of doom. Flying will remain safe, and for conventional reasons, including the admirable reaction we have seen to the ValuJet crash. But it should also be clear that there are structural limits to flight safety, and that any dream of a zero-accident future is probably about as realistic as the old ValuJet promise to put safety first. If that is true, we had better get used to it. Conventional accidents—those I call procedural or engineered—will submit to our solutions, but as air travel continues to expand, we can expect capricious system accidents to blossom. Understanding why might keep us from making the system even more complex, and therefore perhaps more dangerous, too. ☼

C R E D O

In the workaday light
the sun, like a blacksmith,
leaves its hammer print
on the cliffside,
and at night
when all is cool and placid
stars are flashing like knitting needles,
busy at their constellations.
Nothing is ever idle here.
Not even quince and oleander
burning their sabbath incense,
nor hedges of morning glory
bearing trays of purple cups
big enough to drink from,
not even the cat who wobbles by
like a fishing boat
with a full cargo of kittens,
not even the cobblestones
that save up warmth for the evening.

—DAVID SOLWAY





Tree Surfing and Other Lofty Pleasures

Technical tree climbing, with its own vocabulary and specialized equipment, has won enthusiasts in the American West and elsewhere

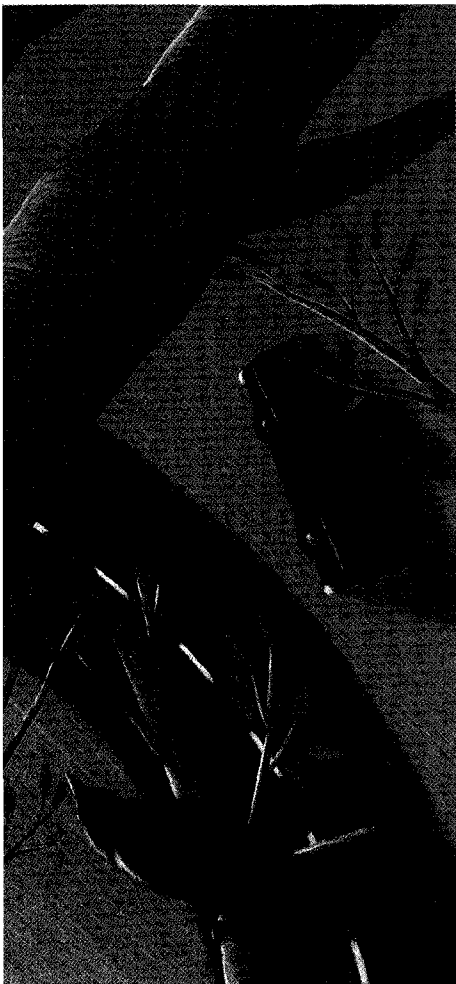
WHEN Tom Ness wants to climb a tree, he usually drives his rusty green pickup truck along the dirt roads of the Siskiyou National Forest, near his home in southwestern Oregon. He studies hillsides thick with old-growth conifers, some as tall as the Statue of Liberty. "A climbing tree

needs good architecture," Ness says, by which he means room to maneuver through the upper branches, and limbs that don't droop, so that the ropes and hammocks he will tie to them can be safely secured. Also, trees laden with sap, or ants, are best avoided. Otherwise, selecting a tree is an in-

tensely private matter. "I look for one that stands out and announces 'Climb me,'" Ness says. Ness is forty-nine years old. He has a soldier's posture and haircut (he served four years in the Navy in the early 1970s), and deep-set eyes. He seems to prefer silence to conversation, and when he does speak, it is with measured precision, as if he were narrating a documentary film. Ness is a difficult man to categorize: He will occasionally shoot a deer to stock the freezer, but whenever he discovers an insect in his house, he cups it in his hands and walks it to the yard—a yard in which each tree has a name: Mamie the Douglas fir, Natalie the sugar pine, Queue the madrone. Every piece of Ness's clothing is green or brown or khaki or camouflaged—"so as not to disturb the forest's color palette," he explains.

Few people older than high school age spend much time in trees; those who do are likely to be arborists, canopy researchers, tree surgeons, or cone harvesters. Ness is none of these. He climbs trees because

by Michael Finkel



he loves to climb trees. For ten years he has been concerned with little else.

On this day, a humid blue spring morning, the tree that calls out to Ness is a ponderosa pine—a “pondo,” he calls it. The tree is so well positioned atop the high point of a narrow ridge that it seems almost to be showboating. Roughly lollipop-shaped, it has an elongated trunk topped with a spherical cluster of branches—“broad-domed wagon wheels of foliage,” in Ness’s parlance. Ness estimates that the tree is 150 feet high and at least 300 years old. He likes it. He unloads several bundles of gear from his truck and walks swiftly through the forest, sensing his way amid the thick undergrowth to the base of the chosen tree.

Most times, though not on this outing, Ness climbs with his wife, Sophia Sparks, a tall, contemplative woman who stands beneath a canopy of curly black hair. She, too, climbs wholly for pleasure. “When you climb a large tree,” Sparks says, “you can’t believe some-

thing living can be that size. It’s wonderfully humbling to feel so small.”

Ness and Sparks are not the only adults to have become smitten with technical tree climbing, as the activity is called. An organization called Tree Climbers International, with headquarters in Atlanta and clubs in France, England, and Germany, has 600 members, including a baobab climber from Botswana. The group’s chief objective is to promote the fledgling sport; the essayist Robert Fulghum, who wrote *All I Really Need to Know I Learned in Kindergarten*, has been an informal spokesperson. At least two summer camps have recently begun offering instruction to children. Several climbers are known to sneak occasionally into the backcountry of Sequoia National Park, in northern California, and scale some of the world’s tallest trees. The actual number of recreational tree climbers is difficult to estimate. “Tree-climber personalities,” Ness says, “don’t fit easily into organizations.”

A tree-climbing vocabulary has evolved. “Tree surfing” occurs when a climber encounters strong winds atop a tree. “Flying traverses” involve shifting from one tree to another without descending to the ground. “Bark bite” describes the scrapes on climbers’ forearms. “Ninja climbs” are those done behind the backs of park rangers.

In addition to being passionate and skillful tree climbers, Ness and Sparks provide an essential service to other climbers: they own a company called New Tribe, which manufactures high-end tree-climbing gear—items with names like Monkeytail and Limbloop and Treeboat. New Tribe operates out of their house, a former Grange hall near the hamlet of Grants Pass. The company has no other employees. “We design everything from scratch,” Ness says, “and we work so closely together that it’s hard to put just one of our names on any of our inventions.” Sales of tree-climbing equipment and of a few unrelated inventions provide all of the couple’s income.

Tree climbing, some feel, is a response to the complexity of modern society, a way of recapturing the spirit of adolescence. “The more stressful life on the ground becomes, the more some people feel the need to take time out in trees,”

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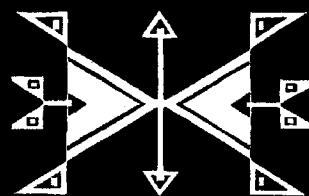
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says Peter Jenkins, the founder of Tree Climbers International, which has experienced a 25 percent membership increase over the past two years. Jenkins likes to stress that tree climbing is entirely non-competitive. A tree-climbing championship is unheard of. This, however, is likely to change. Already records are kept on the tallest tree climbed (a 365.5-foot redwood) and the longest time spent continuously in a tree (nearly a week). Informal speed-climbing challenges are sometimes held among friends.

The larger the number of people who want to be in trees, the more orders New Tribe receives, and the more Ness and Sparks, ironically, find themselves earth-bound. This is why Sparks is unable to accompany Ness today. It is her turn to stay home and grapple with the backlog of orders. On this trip Ness has ventured into the forest with two friends, neither of whom has tree-climbing experience.

AT the base of the pondo Ness produces a large compound hunting bow with a spool of fishing line mounted near the handle. The lowest branch of the tree is nearly a hundred feet above the ground. The trunk is a pillar of yellowish bark, cracked in a honeycomb pattern. Ness inserts a rubber-tipped arrow into the bow, and ties the fishing line to the arrow's tail. "No conscionable climber uses techniques that poke holes in trees," he says, stressing that the recreational-tree-climbing community discourages the use of spiked boots. Ness draws his bow.

The shot is perfect. The arrow arcs over the lowest branch, tight against the trunk, and dives back to earth. Ness retrieves the arrow, unties it, and attaches the fishing line to a length of nylon cord. He reels in the fishing line, so that the cord is now looped over the anchor branch. Next he removes from his backpack a length of thick climbing rope and attaches it to one end of the cord. Once again he hauls in the thinner strand until the thicker rope is looped over the branch, with both ends on the ground. The three-step process is necessary because fishing line will snap if used to carry heavy climbing rope, and anything stouter than fishing line will disrupt an arrow's flight.

Ness ties one end of the climbing rope to the base of a small tree nearby, and leaves the other end dangling. He wriggles into a New Tribe tree-climbing har-

ness, pulling it over his dark-green pants until it rests snugly at his hips and waist. He takes from his pack two ascenders, which look roughly like staple guns. Ascenders clamp onto climbing ropes and can slide easily upward but lock in place if downward pressure is applied. Ness attaches the ascenders, one above the other, to the free end of the rope and begins shimmying upward, inchworm style, until he reaches the first branch. This takes no more than five minutes. There he secures himself to the trunk, sets up a pulley system, and hauls three bags of supplies into the tree—camping gear, climbing gear, a smorgasbord of food. Ness shouts instructions to his friends, and they follow him up, visibly nervous, struggling with the ascenders. Now comes the real climb.

Ness leads the way. Though he is ten stories above the ground, wending through an elaborate spiral staircase of branches, each limb slightly thinner than the last, he climbs with simian grace, quiet, unhesitating. His movements have a springiness that was unapparent on the forest floor. He stretches out his long body (he is six foot two, and virtually fatless) and swings himself over the next branch. Ness is utterly unafraid of heights—but he does not forget that he is human. Before each step he tosses a short length of rope over the branch above him and secures the rope to his harness. He does this in one smooth, elaborate motion, like a pitcher in the windup. If he should lose his balance, he will fall no more than a few inches. Flecks of bark and lichen dislodged by his climb filter through the canopy. "Tree dandruff," Ness calls them.

Near the crown of the tree, where the bark on the branches is still green, Ness works his way into a comfortable pocket formed by the union of trunk and limb. Here, with a euphoriant view over the whole of the forest, the myriad ridges fading to blue against a hazy horizon, he sits and waits. In only a minute or so a breeze comes in strong, batting at the treetops. The ponderosa begins to sway. Surrounding trees, acres of them, start waving and churning in all directions. Soon everything appears to be swinging, clouds and mountains included. The effect is that of riding a dinghy in heavy seas. "You lose all sense of what's stable," Ness says, his voice bright with pleasure.

Tree climbing done correctly, with proper safety equipment, is an exceptionally safe pastime. Though limbs flex and creak, Ness says, they are reliable: "If branches can survive all their usual life experiences—storms, winds, fires, snows—they can certainly withstand a human weight." As far as anyone knows, no recreationalist has ever died as a result of technical tree climbing. Only during professional climbs—when workers have improperly secured themselves or their equipment—have serious accidents, a few resulting in deaths, occurred.

As the wind subsides, Ness descends to the thicker branches while his friends move up for their own tree-surfing sessions. From the bags of gear Ness retrieves three Treeboats. A Treeboat is essentially a rugged hammock, made of thick nylon canvas, with tie-off cords at all four corners. It is the invention that Ness and Sparks are proudest of. "Our designing of this piece," Ness writes in the current New Tribe catalogue, "was a watershed event in our personal lives." Treeboats allow climbers to sleep comfortably amid the grand architecture of centuries-old trees. Ness darts about the branches, tying cords and adjusting stabilizers. "I think like a spider," he says. In no time three Treeboats are slung within the ponderosa, positioned for optimal sunset viewing. Down sleeping bags are added, and tiny pillows.

TREE climbing is normally considered child's play—but Ness came to it extraordinarily young. He had a peripatetic youth: Batavia, Illinois; Casa Grande, Arizona; Los Molinos, California. His mother, Darlene, says he began scaling lilac bushes when he was two, apple trees at four, and carob trees soon after. For almost a decade his father, Sonny, worked as a tree trimmer for the Davey Tree Expert Company. "Dad always said you'd have to be a fool to climb trees for the fun of it," Ness says. Regardless, by the time Ness was ten, his father had hung a rope on a Modesto ash, and Ness had completed his first technical tree climb. In his teenage years his attention wandered to other pursuits. Following his stint in the Navy he settled in San Francisco and worked in the construction trade. He met Sparks in 1983.

During the couple's frequent hikes in the parks of Marin County, Ness found

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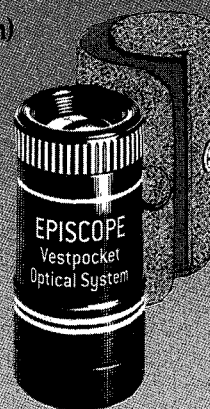
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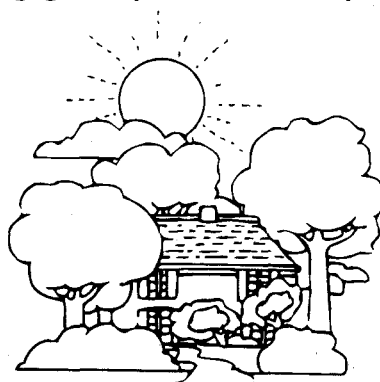
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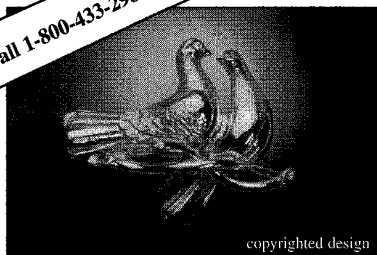


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himself increasingly eager to take leave of the forest floor and again work his way up a tree. He mail-ordered ropes and ascenders from a military-supply company. In 1987, on a foggy summer day at California's Point Reyes National Seashore, climbing alone, he scaled a wide-armed Douglas fir. Immediately he was hooked. He introduced Sparks to the sport, and in 1989 they began manufacturing tree-climbing equipment. A year later they moved to rural Oregon.

High in the pondo, rocking tranquilly in his Treeboat, Ness slips into a kind of reverie he calls "tree time." For a while nobody speaks. The air smells richly of pine. Off in the woods comes a high-pitched screech. "That's a pileated woodpecker," Ness says. "Funny, I know the voice but not the face. It's like a radio personality."

He identifies nuthatches and pine siskins, tanagers and titmice. When he's stumped, he says, "Oh, that's a be-de-beep" or "I call that an LGB—a little gray bird." He points to various ridges, picking out the trees he has climbed. He recalls the first time he tested a Treeboat, in a Douglas fir on California's Mount Tamalpais. "It was right above a trail, and eight or ten people walked below. They didn't see me. One of them said, 'If I were a young man, I'd climb that tree.' I leaned over and called down, 'It's a nice one. Come on up.' They just about fell over."

Past sunset, when the treetops are hemmed with gilded light and the forest floor has gone to black, Ness muses about sequoias. He has climbed three of them. "They are the holy grails of tree climbing," he says. "Sequoias are out of scale with any living thing on this planet. They can grow for three thousand years. Of course, to climb one you have to ninja it, but that's reasonably easy to do."

Not everyone shares Ness's enthusiasm. Nalini Nadkarni, the president of the International Canopy Network (a consortium of professors, scientists, and others with an interest in canopy research) and a professor of environmental studies at The Evergreen State College, in Olympia, Washington, says the research community is troubled by the presence of recreationalists in the treetops. "I've found myself waffling back and forth about what actions to recommend," she admits. "It's a tough ethical issue. I understand the desire to explore,

but forest systems are delicate. With tree climbing you're in contact with living material almost the whole time—it's like walking on a coral reef. Many species of spiders, beetles, slugs, and birds are specific to the forest canopy, and depend on arboreal mosses for food and nesting supplies. The damage from a single boot scrape can take decades to regenerate." Forest rangers at Sequoia National Park view unauthorized tree climbs as "damaging the resources"; the maximum penalty is six months in jail and a \$5,000 fine. Though climbing on national-forest land, like the Siskiyou, remains legal, national parks are more tightly regulated and many are off limits.

Ness views things differently. He'd like to see as many tree climbers as possible (and one or two more tree-gear makers). "True, we might knock off moss mats," he says. "Meanwhile, whole forests are being reduced to stumps. Climbing might provide another human use for trees besides door trim." Ness, who is renovating his house, refuses to build with wood. He uses steel beam and Sheetrock.

Up in the tree the evening birdsong subsides and the stars brighten. The climbers prepare for sleep. To protect against rolling over too far, the climbing harness must be kept on, attached to a length of webbing that is in turn tied to a branch above the sleeper's head. Bathroom needs are problematic. Any possessions dropped over the side of a Treeboat are gone for the night. Still, the breeze is soothing, as is the susurrus of the branches. Sleep comes easily; no one stirs until dawn.

Morning, though, brings the disquieting sound of chainsaws over the birdcalls. The Siskiyou is heavily logged. From atop the pondo a dozen shaved hill-sides can be seen. Ness knows that, inevitably, a tree he likes to climb will be cut down. "It will be like having a friend killed in a drive-by shooting," he says.

Once everyone is awake, Ness furls the Treeboats and tosses them to the ground. Then he and his friends rappel down the rope, making an acrobatic return to solid ground. Eighteen hours have passed since the climb began. The equipment is collected and hauled back to the pickup truck. Ness coaxes the engine into turning over, looks up at the ponderosa one more time, and rumbles out of the forest. ☼



Belgian and Bubbly

*Belgium's abbey-style ales,
now also being brewed in America, get their
marvelously deep flavors from the
méthode champenoise*

BEEER and pubs play a role in Belgium very much like that played by espresso and caffes in Italy, so it's no wonder that on a recent trip I went from pub to pub, sampling the brews on offer. Men and women from all walks of life meet at all times of day in Brussels pubs—well-lighted, if smoky, places where you can strike up a conversation with the people at your communal table, and sit for as long as you like; the drinking speed seems to be one and a half beers an hour. Beer taps are maintained with the loving care given espresso machines in Italy. Belgium, es-

pecially Brussels, is famous for its Art Nouveau and Art Deco, and the styles are by turns sinuously and angularly apparent in chromed spigots.

My notion of Belgian food involved Eurocrats tucking into big helpings of mussels and french fries, ending with the world's best chocolates, and fortifying themselves with snacks of waffles and spice cookies in between. I found all this. I also found a culture just as attuned to food as the French but less showy about it—as Belgians seem to be about nearly everything. (Any generality about

by **Corby Kummer**

Belgium must take into account the ever more hostile division between French-speaking Wallonia, in the south, and Flemish-speaking Flanders, in the north. Nonetheless, the two parts share the Latin appreciation of food and wine—in contrast to Belgium's neighbors Germany and the Netherlands.) This quietly obsessive interest in food, described in Ruth Van Waerebeek's lovely *Everybody Eats Well in Belgium Cookbook*, naturally extends to beermaking, given that Belgium lies north of the grape-growing belt.

I quickly narrowed my search to dark Trappist and abbey-style ales—unusual even in the rapidly expanding and novelty-crazed world of specialty beers, and startlingly different from any of the beers I knew. Sweet and creamy, abbey-style ales are so deep and full-flavored that each time I drink them—as I now often do at home, since they are easy to find in this country—I feel as if someone had turned up the reverb knob all the way.

ANYONE interested in coffee roasting or sourdough bread will find beer a natural subject of fascination. The color of beer depends chiefly on how long its component grains are roasted. As with coffee, dark roasts create the sweet, toasty flavors of caramel, and dark beers are frequently described as tasting like coffee. (Roasting decreases the amount of sugar in the grain available to be fermented, so despite their strong-looking color, dark beers are not necessarily higher in alcohol than light ones.) Dark-roasted barley, the base for dark beer, is even a traditional surrogate for coffee.

The yeast that converts the sugars in roasted grain to alcohol—Belgians sometimes include wheat or corn with the barley, and other brewers sometimes add oats, rye, or rice—is crucial to the final flavor, just



as it is in sourdough bread. Belgian brewers keep their yeast strains under lock and key. They also take rigorous precautions to preserve a copy lest a brewing accident wipe out the yeast. Without the right strain they would never be able to recapture a particular beer's flavor.

Certainly, other places produce great beers. Czechoslovakia and Bohemia are the originators of the world's overwhelming choice, golden pilsener lager—a clear style made possible by slow-acting yeasts that work at low temperatures (*lager* means “cellar”). Ales ferment at much higher temperatures than lagers, resulting in flavors that are stronger and more complex. England,

TRAPPIST ales and their many imitators, called abbey-style ales, represent just one of many Belgian beer styles, some of them curious indeed. Of Belgium's approximately 100 breweries, producing about 650 beers (an astonishing figure given the country's population of 10 million), about 70 percent make dull lagers. The remaining 30 percent make “specialty beers,” which can be as golden as pilsener or as black as stout. Some are an acquired taste, such as cherry-flavored beer ripened in oak barrels (the red Flanders ales of Rodenbach are revered) and funky, sour-fruit-spiked “lam-

lar tourist site for Belgians. Today only fifty monks remain, and they use revenues from the beer, cheese, and bread they produce to help keep the monastery operating (additional profits are donated to charity); lay workers staff the brewery. The first official I saw there, however, was a monk, racing down the stairs from a platform that held a gorgeous copper tank sprouting swan's-neck spigots and wheel-shaped handles and huge chromed bolts, like a Jules Verne bathysphere. Suspended at the front of his sash was a leather holster for his beeper.

What makes Trappist and abbey-style ales stand apart is multiple fermentations with different strains of yeast, at both low and high temperatures, and a final addition of yeast so that the beer will ferment again in the bottle. This is precisely the method that champagne producers use, to add depth and new flavors. Also as with *méthode champenoise* wines, the beer's light carbonation results mainly from the fermentation in the bottle, which can go on for weeks, in expensively climate-controlled storerooms. Other beer makers simply inject beer with carbon dioxide as it is bottled.

The gentle bubbles mean that the beer is less thirst-quenching: carbonic acid serves to sweep the palate, which is why soda water can double as a mouthwash and Coca-Cola straight out of the bottle isn't unbearably sweet, as flat Coke is. These ales are meant to be sipped rather than chugged. The ideal serving temperature is close to the one at which they ferment—about 50°F.

Trappists add something else to ensure that unusual strength: plain sugar. A German purity law instituted in 1516 still forbids this or any other adulteration. The only ingredients permitted in German beer are malted grain, water, hops, and yeast. Nearly all specialty Belgian beer, however, has a higher alcohol level than does standard beer: six, seven, even 12 to 14 percent, as high as the level in wine (four or five percent is standard for American pilsener-style lagers). The level is comparable to those in English barley wine and Scottish strong ale—both of them named for their high alcohol content, and both coming back into fashion. More alcohol means a stronger aroma, a heavier body, and a creamier texture.

The brewery at Orval makes just one

bic” ales, which ferment spontaneously—that is, with airborne yeasts that happen to settle on the open tanks, rather than with selected, added yeasts. Only six Trappist abbeys in the world still make beer, five of them in Belgium and one in Holland. This is at odds with the dozens of labels that picture monks or stained-glass windows or quaint churches. Some commercial brewers have licensed abbey names and, occasionally, abbey recipes. Others simply trade on the reputation that Trappist brothers worked centuries to gain. Last fall the six abbeys moved to adopt a hexagonal symbol to put on their own bottles as a mark of authenticity.

Orval, in the valley of the Ardennes in the southeastern corner of Belgium, is almost too beautiful to be true. Its seeming late-medieval perfection is in fact a creation of the mid-1920s, when the largely destroyed abbey was redesigned and rebuilt, in what became something of a national project: the complex was pictured on stamps, and the abbey is still a popu-

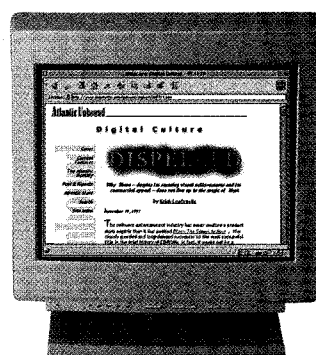


Ireland, and Scotland still make the amber-to-near-black porters and stouts that hooked Americans in search of relief from the anemic, mass-produced lagers that “beer geeks,” as enthusiasts proudly call themselves, dismiss as “wet air.” A new generation of American artisans revived old-style ales, as William Least Heat Moon recounted in “A Glass of Handmade,” in the November, 1987, *Atlantic*. The chocolate overtones and sweet roasted flavors of these ales first made me see how much more there could be to beer. But my true epiphany came only when I entered the quiet, orderly world of a Trappist monastery.

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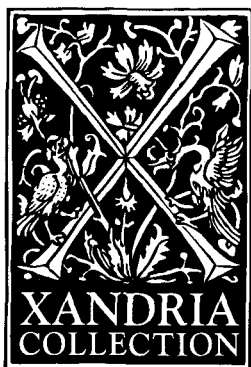


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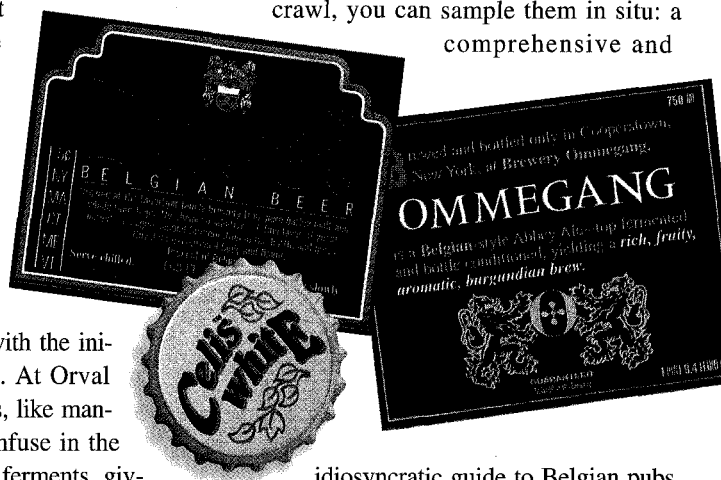
kind of beer, another reason I prize it. Almost every other maker, including some of the Trappist abbeys, produces two or three or four different ales; although each kind has its reasons for being, the choice is confusing. Also, I'm extremely happy with Orval's ale, and not just for its cheerful topaz color, the confident fat 1930s lettering on the label, and the shapely bowling-pin bottle, which is said to help keep yeast sediment from getting into the glass. Orval beer is drier than other Belgian beers that can boast anything like its depth, and not bitter despite the high hops content. Hops, the herbal flowers that act as a preservative, give beer its balancing bitterness when they are boiled with the initial sweet liquid. At Orval big sacks of hops, like man-sized tea bags, infuse in the cooled beer as it ferments, giving spiciness rather than bitterness.

Orval ale undergoes three separate fermentations over ten weeks; a typical American lager goes through one fermentation and is immediately carbonated and bottled. Even ten weeks isn't enough for some fans. Many people wait a year or longer to drink "bottle-conditioned" beer, preferring the mellow, toasty flavors that develop. Others prefer the fresher, livelier flavor of the beer as soon as it is ready. Champagne buyers divide into similar camps.

Most other Trappist and abbey-style ales are much sweeter than Orval—a characteristic of "double" and "triple" ales, terms that imply high alcohol levels resulting from the addition of sugar. Chimay, the best-known and most widely distributed genuine Trappist ale in both Belgium and the United States, comes in three strengths, each with a different-colored label; all three are darker and sweeter than Orval, and to my mind marginally less enticing (buy Chimay's Grande Reserve if you have the choice). Harder to find but superlative are the three Rochefort ales, called simply Rochefort 6, 8, and 10, for their alcohol levels. These have deep chocolate notes and hefty body that practically roars across your mouth.

Also superb, and better-distributed, is Affligem, a marvelously smooth abbey-style ale with tastes of honey and chocolate and a pronounced bitterness from hops. Each flavor remains in check, displaying what American imitators still need to learn from the Belgian originals: the secret of balance.

I'm skipping over the many colors and strengths and flavors of other Belgian beers. If you find yourself in Brussels and in the mood (as you should be) for a pub crawl, you can sample them in situ: a comprehensive and



idiosyncratic guide to Belgian pubs, by Stephen D'Arcy, is available from CAMRA Brussels; the E-mail address is Stephen.D'Arcy@dg1.cec.be. Michael Jackson's *Great Beers of Belgium* gives an authoritative overview; F. Paul Pacult's new *Beer Essentials* is a good introduction to beer in general; and a few Web sites are also helpful, for instance worldofbeer.com.

Belgian specialty beers are available here with surprising readiness. I found exotic lambics at two liquor stores on my own street. You can call Vanberg & DeWulf, distributors of Affligem and many other specialty beers, and also the distributors of Jackson's book, at 800-656-1212, or Merchant du Vin, the distributors of Orval, at 206-322-5022.

I should mention one supreme oddity that in just twenty-five years has become Belgium's leading specialty beer. Duvel, from the Dutch word for "devil," is fermented in stages as controlled as those for any Trappist ale (the minimum production time is eleven weeks). Its flavor is nearly as deep and is markedly sweet, with prominent citrus notes. The bubbles are as tiny and perfect as those of the best champagne: they look almost artificial when the beer is poured into a sort of trick glass with a rough patch at the bot-

tom to catch the bubbles and release them steadily upward. (Belgian breweries produce hundreds of special glasses for their beers.) What's odd about Duvel? The brewery uses heavy lacings of sugar and light-roasted barley to make a beer as high in alcohol—8.5 percent—and as hard-hitting in body and flavor as any double, but as light in color as any pretty pilsener. "The Marilyn Monroe of beers," Wendy Littlefield, half of the husband-and-wife team that imports Duvel into the United States, calls it.

Belgian beers are replacing British and German ones as the models for American brewers. Nine years ago Pierre Celis, who in Belgium revived the tradition of yeasty spiced white beers (made from wheat and light-roasted barley), sold his business and bought land in Texas, where he makes the much-lauded Celis White. Other Belgians have started brewing for small American companies. Unfortunately, the dropoff in complexity among some abbey-style ales, especially those made here, is marked: body is thin and the flavor one-note, be it sweet, sour, or bitter.

After more than fifteen years of importing specialty Belgian beers and making Americans aware of their virtues, Wendy Littlefield and Don Feinberg, her husband, have joined forces with two of the companies whose beers they sell to build a beautiful brewery in a long farmhouse in Cooperstown, New York. They call it Ommegang, for a colorful Renaissance Belgian festival. Guided by Bert DeWit, a recently transplanted Belgian brewer, Ommegang will produce three styles of ale, using specially, and locally, cultivated yeasts. In the step that the couple claims will differentiate them from other American brewers following Belgian styles, the beers will be bottle-conditioned for at least a month; the flagship brew, also called Ommegang, just arriving in stores, is a beautiful garnet-colored abbey-style ale.

If it seems odd that independent Belgian brewers would willingly go into competition with their own products, just think of champagne. Twenty years ago the big French names opened wineries in the Napa and Sonoma Valleys, in order to protect the American franchise of the best real champagne. With any luck the same thing will work for its malted equivalent. ☼

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War in the Mind

A book that breaks new ground in its analysis of the psychiatric casualties of battle

by James M. McPherson

SHOOK OVER HELL: Post-Traumatic Stress, Vietnam, and the Civil War

by Eric T. Dean Jr.
Harvard University Press,
315 pages, \$35.00.

REVIEWERS of historical works overuse the adjective "revisionist" to the point that it has become a cliché. In this case, however, the adjective is doubly merited. *Shook Over Hell* is genuinely revisionist on two fronts: it changes our understanding of psychiatric casualties in both the Vietnam War and the Civil War; and it does so not by sleight of hand, redefining terms while leaving the substance unchanged, but by solid research, sound analysis, and lucid (if at times repetitious) writing.

Eric Dean first challenges the myth of the troubled and scorned Vietnam veteran. The myth goes something like this: Sent to fight a dirty and unwinnable war, whose purpose they never understood, against an enemy they rarely saw in menacing jungles and rice paddies, amid a civilian population that hated and betrayed them, American soldiers in Vietnam turned to drugs and "fragging" and returned to a nation that scorned and spit upon them. As a consequence, many of these veter-

ans formed a pathological subculture of unemployed addicts, criminals, and underachieving misfits who suffered from post-traumatic stress disorder and astronomical suicide rates. These experiences contrasted sharply with those of veterans of other American wars, who came home to victory parades, the GI Bill, and other kinds of preferential treatment, and who therefore readjusted quickly to civilian life with few psychiatric complications.

tend college than had veterans of the Second World War. Wildly inflated estimates that 60,000, 100,000, or even 159,000 Vietnam veterans have committed suicide (six to sixteen times the rate for a comparable civilian group) are replaced by careful studies concluding that 9,000 veterans had taken their own lives by the early 1980s, at a suicide rate similar to that among civilians. As for psychiatric casualties during the war itself, twelve

cases were diagnosed per thousand in Vietnam, as compared with thirty-seven per thousand in Korea and twenty-eight to 101 per thousand (depending on assignment) in the Second World War. Perhaps this is not surprising, given that fewer than 15 percent of U.S. troops in Vietnam served in combat units; the rest were in support, supply, and medical services.

But what about post-traumatic stress disorder (PTSD)? Have not Vietnam veterans suffered an extraordinarily high rate of such delayed reactions in the form of nightmares, flashbacks, survivor guilt, sleeplessness, depression, startle reactions, stuttering, loss of energy and sexual de-

sire, and other dysfunctional behavior years after the horrors these men experienced in Vietnam? PTSD emerged as an officially recognized psychiatric syndrome in 1980, when the American Psychiatric Association listed it in the *Diagnostic and Statistical Manual*. PTSD represented a refinement of what had been known as shell shock in the First



Dean convincingly demolishes every part of this myth. Citing numerous surveys and studies, he demonstrates that in the 1970s and 1980s Vietnam veterans had higher median incomes than their nonveteran peers and were unemployed at the same rate, had similar rates of drug use and addiction, and, in percentage terms, used more GI Bill benefits to at-

World War and as battle fatigue or combat stress reaction or, more generally, psychiatric casualties in the Second World War. PTSD differs from some of these in part because it focuses on the *delayed* trauma of combat, which may not manifest itself fully until months or years after the event.

The category "PTSD" developed from efforts to understand certain behavior patterns that occurred among Vietnam veterans. Dean makes it clear that diagnoses of PTSD gained a life of their own: once the category had been recognized, it was applied to all sorts of behaviors not previously considered exceptional. PTSD has now become a fad. Dean quotes numerous examples of this phenomenon: some professional football players are said to have "developed post-traumatic stress disorders comparable to those experienced by some Vietnam veterans"; during the agricultural depression of the 1980s mental-health workers said that "psychologically rural Iowa resembles a Vietnam veteran with post-traumatic stress disorder"; teenagers pressed to overachieve by their "hothouse style of upbringing are now suffering post-traumatic stress syndrome like Vietnam veterans." The Defense Department jumped on the bandwagon, attributing the mysterious ailments suffered by some veterans of the Gulf War to PTSD instead of to exposure to Iraqi chemicals, which may be responsible. A backlash against the PTSD fad inevitably emerged. One veteran spoke out bitterly against the "ludicrous blubbery and psychobabble" about the Vietnam veteran as a misfit and a loser. A jaded film critic assigned to write a review of yet another Vietnam movie declared, "So familiar has this story become that I have started to think of it as a brand new film genre—the PTSD (Post-Traumatic Stress Disorder) genre."

Dean pulls no punches in his analysis of this fad as a consequence of political and social agendas advanced by Robert Jay Lifton and other anti-war psychiatrists, who used the myth of the psychologically crippled veteran to discredit the war; by right-wing patriots, who (paradoxically) used the same myth in their argument that American soldiers were frustrated by restraints from Washington that prevented them from winning a war they could have won; and by veterans' organizations, which lobbied for more government assistance "to entrench and

extend their already extensive benefit package." Dean also offers caustic commentary on the quest for "acquisition of power and influence by the psychiatric profession," which has

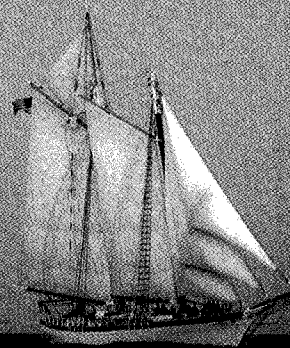
a track record of advancing diagnostic categories that lack clear underlying unity based on scientific evidence, but that, nonetheless, have the effect of responding to popular needs and aggrandizing the power and authority of mental health professionals.

EVEN though Dean discusses the possibility that PTSD is "a grab-bag of symptoms" rather than "a distinct psychiatric disorder," the core of this book is an application of the PTSD concept to Civil War soldiers. Part of the myth of the scorned and troubled Vietnam veteran is the implied contrast between his postwar treatment by a hostile or indifferent society and the hero's welcome given veterans of other wars. Although many studies of Civil War soldiers have appeared in recent years, they have focused mainly on the wartime experiences of these men; their postwar history has been relatively neglected. Union veterans returned home as victors, celebrated by parades and official receptions. Confederate veterans did not have this solace, but the romanticization of their heroic courage and pure devotion to a sanctified though doomed Lost Cause fulfilled the same cathartic function. Dean writes, "A reexamination of the Civil War veteran through the lens of the Vietnam experience promises new perspectives and challenges, regarding . . . the assumption that Civil War veterans readjusted well after their war."

The combat experience of Civil War soldiers was more intensive and prolonged than that of American soldiers in Vietnam. The actual number of American soldiers was the same in both wars: three million. This represented nearly 10 percent of the U.S. population in 1861, as against 1.5 percent of the population in 1970. The number of American dead in the Civil War was 620,000; in Vietnam it was 58,000. In proportion to the population, the death rate was sixty-nine times as great in the Civil War as it was in Vietnam. The ratio of combat to support troops in Vietnam was one to seven; it was almost the reverse in the Civil War. Some 35 percent of Civil War sol-

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diers were killed or wounded, as compared with 5.5 percent of U.S. soldiers in Vietnam. There was no helicopter evacuation of the wounded and no antibiotics or antiseptic medicines in the Civil War. The physical hardships endured by Civil War soldiers would have been almost inconceivable to an American in Vietnam.

In view of these facts, Dean is quite right to hypothesize a high incidence of psychiatric casualties during the Civil War and of what we now call PTSD afterward. The problem in identifying these phenomena is that Civil War medicine had no term or concept to describe them. But observations by surgeons, officers, and soldiers themselves make clear the frequency of psychiatric casualties, which were all too often officially regarded as cowardice or malingering. Nevertheless, diagnoses of "insanity," "homesickness," "melancholy," "acute mania," "dementia," "nostalgia," "irritable heart," and even "sunstroke" offer hints of an effort to identify and understand these casualties. Dean also presents evidence of a higher post-Civil War crime rate among veterans than among nonveterans, of nightmares and flashback recollections, of disorderly behavior, and of suicide (though data to compare veteran and non-veteran suicide rates do not exist).

Dean's research in Civil War letters and memoirs, postwar newspapers, and pension files was thorough and exhaustive. It has yielded more information about the mental health of Union veterans than historians had previously realized was available. (Comparable sources for Confederate veterans are much thinner or nonexistent.) The most original and important feature of this book is Dean's analysis of 291 case studies of Civil War veterans committed to the Indiana Hospital for the Insane. Most of them exhibited symptoms that would today be diagnosed as PTSD. The inquest record for one such inmate, Jason Roberts, supplied the title for this book:

Says he has been shook over hell. . . . Sometimes he is raving and excited, at others melancholy . . . Very peculiar and excentric. flying from one Subject to another, and talking incoherently on all Subjects, . . . The subject of religion and his experiences in the army being paramount in his mind . . . [he] thinks all his enemies should be in hell.

The amount of effort and patience required to match these asylum inmates with their combat experiences is awe-inspiring. Yet a caveat is in order. Does Dean ask the right questions about this sample?

Is the Indiana Sample of 291 men representative of Civil War veterans in Indiana or elsewhere? Can the problems of the men in this sample be generalized to a significant proportion of the approximately 180,000 [actually 135,000] Indiana veterans or the 1.9 million Union veterans?

The answers would seem to be obvious: men committed to a hospital for the insane are by definition not representative, and their problems cannot be generalized.

Having put so many hundreds of hours of research into this sample, however, Dean wants it to bear more weight than it possibly can. He acknowledges that the regiments to which these 291 men belonged had higher than average casualties from both disease and combat, but "the most salient point about the Indiana Sample is how close to average it seems in so many other respects." He continues, "One is tempted therefore to think that the problems of the Indiana Sample could not have been atypical." This is sloppy thinking. The question is not whether these men and the units to which they belonged were representative in a variety of objective criteria—age, occupation, ethnicity, length and theater of service, number of battles, and so forth—but whether their psychiatric problems were typical or representative of the personalities of the more than 99 percent of Civil War veterans who were never committed to an asylum. To suggest otherwise exposes Dean to the same charge of inflating the psychiatric casualties and PTSD of Civil War veterans that he has so effectively proved against superficial students of Vietnam veterans.

Despite this caveat, the Indiana Sample in combination with other evidence sustains Dean's conclusion that historians have overlooked a significant incidence of PTSD among Civil War veterans—probably greater than that among Vietnam veterans. Of this book it can truly be said, as it is all too often falsely said of other historical studies, that it breaks new ground. ☛

How to Pay for a Good College

by Donald Kennedy

THE STUDENT AID GAME

by Michael S. McPherson and
Morton O. Schapiro.
Princeton University Press,
161 pages, \$29.95.

TOWARD the end of the 1980s, as university budgets tightened, I found myself worrying about how long Stanford University, of which I was then the president, could hold to its stated (some would say actively touted) policy of "need-blind" admissions—the practice whereby some private institutions admit undergraduate students without considering how much financial aid each will require. It is an expensive policy, supported by endowments that have been shrinking in real terms in many places. Thus a general retreat seemed probable, and that was causing concern among prospective applicants, their parents, and their college counselors. "Need-blind" had taken on symbolic value: it signaled that merit mattered more than means, that ability could guarantee access. Minority students in particular were distressed at the prospect that a trusted commitment might be withdrawn.

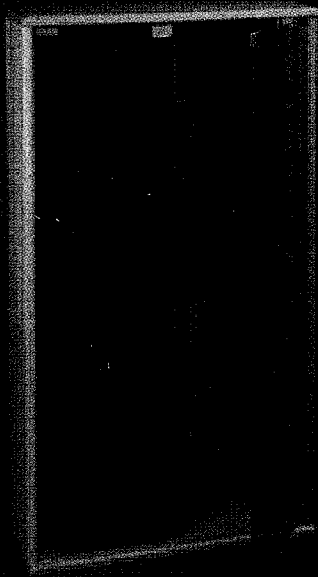
I'm glad to say that Stanford still has a need-blind policy. But, as Michael McPherson and Morton Schapiro demonstrate convincingly in *The Student Aid Game*, the policy looks a lot like an endangered species over most of its range. This timely book appears amid a gathering storm of protest about college costs and how to meet them—a circumstance that finds admissions and financial-aid officers facing more anger and dismay than they can remember. But the colleges are adding to the problem: students deciding where to go—and then trying to figure out, with their parents, how to pay for it—now encounter a bewildering array of "enrollment strategies" and offers of discounted tuition. Elite institution A has a

view of the family's financial need different from that of institution B; meanwhile, institution C, slightly less prestigious, is offering a free ride. The resulting confusion and apprehension often drive families into the arms of private counselors, who offer, for a price, to help them master the system. They would be well advised to save their money and consult McPherson and Schapiro instead.

The authors, distinguished economists who have specialized in higher education, clear up the confusion in a remarkably lucid and thorough analysis of an increasingly complicated system. Financial aid, they explain, is best understood as a price discount offered by colleges and universities to fulfill their own particular needs. An increasing number of institutions are just trying to meet enrollment goals: the marginal cost of adding one student is less than it costs the college to educate the average student; thus charging the extra student less makes perfect sense. But the wealthiest and most selective private schools want the very best students; their need-blind admissions policies are attractive to high-merit applicants who can choose among colleges on the basis of quality rather than price.

Need-blind admissions policies are based on another principle, less sharply delineated in the book. It is the value that diversity (not only racial and economic diversity but a range of interests and talents) brings to the university as an educational asset—just like good laboratories and excellent teachers. This principle rests on the little secret, closely held in elite higher education, that students extract more value from their fellow students than from the faculty. Prestigious institutions offer their students bright, interesting, and diverse companions in learning—and, not incidentally, valuable networks to carry into the rest of their lives. Financial-aid policies support this asset by allowing the institutions to compose, rather than merely admit, a first-year class. The linchpin of this strategy is to admit students without regard to need, and then to meet the full need of those admitted. Its practitioners argue that the policy supports another important principle: that higher education should be accessible to students of high aptitude and accomplishment without regard to their ability to pay. It reflects both the meritocratic conviction that society

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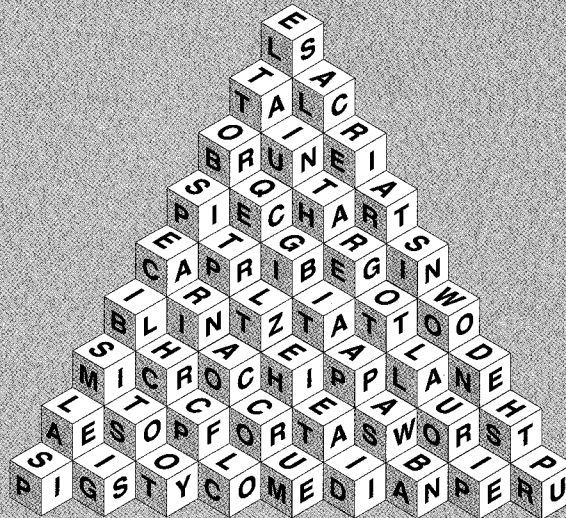
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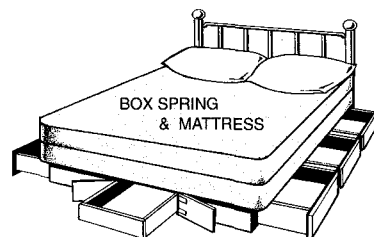
needs the best minds and the egalitarian view that the opportunity to be at the top of the merit heap should be open to all.

And yet, as McPherson and Schapiro show, all but a few private colleges and universities have found the need-blind, full-need policy too costly, as the gap between tuitions and family income has widened, and as discretionary institutional resources have shrunk. In the struggle to attract students (the term "game" would not be out of place) financial-aid and admissions strategies are formulated against a background of vital economic necessity: the need to fill classrooms and dormitories. Financial aid may be directed, as "merit aid," to attract good students, while applicants who have indicated an especially intense desire to attend are denied aid on the presumption that they will enroll anyhow.

The authors are understanding about the financial exigencies that lead to such strategies, pointing out sensibly that "there is nothing ethical about keeping a policy that drives the school to financial insolvency, forcing it to sacrifice instruction, basic student services, and other essentials." They are less forgiving, however, toward those institutions whose resources and distinction place them just on the fringe of the need-blind sector. Knowing that it is an important label to keep, these places often practice a kind of technical virginity—either creating a category at the margin in which students are admitted but denied aid, or "gapping" by offering some students less aid than the standardized federal means tests say they need. Sadly, this hypocrisy is driven in part by the ranking systems employed by certain popular newsmagazines and some college guides. These lists, much criticized but closely watched in the higher-education community, include "selectivity criteria" that allow an institution to improve its ranking if it can show improvements in the proportion of admitted students who actually enroll. Student aid has become a device for manipulating these yield statistics.

MUCH of *The Student Aid Game* is devoted to private institutions, where both authors have spent most of their careers and where relatively high tuitions make financial-aid policy an especially compelling matter. But of course the majority of enrolled students are in

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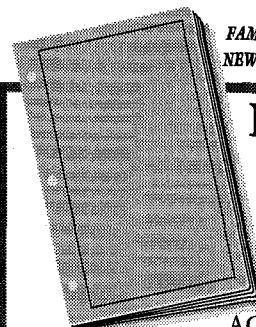


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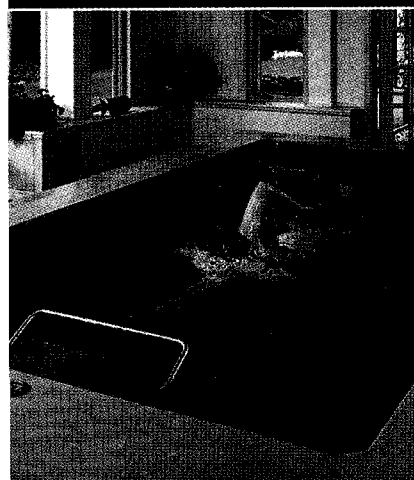
public (that is, state-supported) institutions. The behavior of the public universities and colleges in many respects resembles that of the private: they compete for the same students and are ranked in the same popular guides. But there is an important difference: most state-university tuitions are held far below the cost of education by policies formulated in an era when "higher education for all" had universal political appeal.

The authors present new data on student choices between private and public institutions. These indicate that 38 percent of first-year students from families with annual incomes over \$200,000 attended public institutions in 1994, whereas 31 percent of the equivalent income group did so in 1980. *The New York Times*, in an article that preceded the book's publication, described this finding in a story headlined "AFFLUENT TURNING TO PUBLIC COLLEGES." Whether one views that shift as significant probably doesn't matter much; the important question, on which McPherson and Schapiro touch only lightly, is whether the huge subsidy thus offered to wealthy undergraduate students represents a sound public investment.

In California a magnificent state university system serves more than 120,000 students, of whom more than a third come from families whose incomes are too high to qualify for financial aid at most of the state's many private institutions. The gap between the nominal tuition charged by the University of California (always labeled "fees"—"tuition" is a politically incorrect term in that system) and the real cost of undergraduate education cannot be calculated precisely, because UC has never revealed the latter figure. But it is surely not less than \$10,000 annually. That amounts to a \$400 million annual subsidy, with no means test whatsoever. It is small wonder that a bargain of this quality is being snapped up by students; they love it, and their association defends it with a paid lobby in Sacramento that vigorously opposes any increase in fees. One does wonder, though, how long free rides for wealthy kids could survive serious scrutiny against competing social needs.

AMONG the many splendid qualities of this book is how clearly it illuminates such policy questions. When they turn to the role of the national govern-

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ment, the authors have some pointed advice. First of all, don't scrap federal aid programs for the wrong reasons. William Bennett, when he was Secretary of Education, claimed loudly (though without evidence) that government student-aid programs caused private colleges to capture the revenue by raising tuition. McPherson and Schapiro devastate this claim—first by showing that the structure of the existing Pell-grant programs gave colleges no incentive to raise tuition, and then by reporting an empirical study in which multiple financial variables were compared. The study demonstrated that there was no relationship between the federal student aid an institution received and the tuition it charged.

The authors argue that some current proposals by the Clinton Administration—especially the tax-deduction feature—could provide incentives to raise tuition. They are not particularly kind, either, to the Hope and Honors scholarship initiatives, which are directed at helping students of relatively high achievement. Their analysis shows clearly that these students are being well taken care of in the present scholarship "market." Federal programs should therefore focus on the issues of need and access—areas in which the present student-aid game has left significant voids.

Perhaps the authors' sharpest advice is reserved for the private colleges and universities. There are clearly have and have-not institutions in terms of financial security, and further declines in public and private financial support will, McPherson and Schapiro believe, tend to increase the gap between them. No one should expect that all institutions will deploy financial aid or practice admissions in the same way. But, the authors emphasize, we have every right to expect that each institution will disclose its policies and discuss them openly. The authors set a good example in confessing a quandary of their own having to do with "merit aid"—scholarship assistance given entirely without regard to need. They are plainly uncomfortable about it, having a predilection for equity and recognizing that it is the high-prestige places that offer the largest subsidies for each student's education. Yet they point out that merit aid spreads good students among more places, raising the quality of some less highly regarded institutions, and placing students in colleges that will care more about them. They don't supply a ready-made answer, thereby reminding the reader that this is, after all, a tough, complex challenge in educational policy—one that engages that old and difficult balance between quality and access. ☛

BRIEF REVIEWS



Genuine Reality: A Life of William James

by Linda Simon.

Harcourt Brace, 496 pages, \$35.00.

It takes some time for Ms. Simon to get to her subject, because William the philosopher, Henry the novelist, and their three sad siblings were products of an upbringing by Henry James Sr., an unsuccessful aspirant to the status of Ralph Waldo Emerson. Henry Sr., inconsistent in his thinking and his actions, was an

eccentric who requires space to explain, and the biographer rightly gives it to him. When she reaches William, the text is no less interesting, for her subject battled ill health, shyness, and a series of false starts before discovering his abilities as a thinker and a psychological innovator. He quickly earned respect for his ambition to "have settled the Universe's hash," but his own condition was a permanent problem. As an inquisitive and open-minded investigator, he would try anything, from European spas and local "mind cures" to

injections of goat's lymph and now-illegal substances similar to opium. Ms. Simon has a wealth of good material to discuss or to quote—James's letters to family and friends are witty, candid, and often mischievous—and she describes his shifts in philosophical thinking lucidly. He was a remarkable man with ideas in advance of his own time and still in the forefront.

The Road to Ubar: Finding the Atlantis of the Sands

by Nicholas Clapp.
Houghton Mifflin, 331 pages,
\$24.00.

Mr. Clapp was making a documentary film about the reinstatement of oryxes in Oman when he and his wife got a first, limited view of Arabia's Empty Quarter. They were fascinated. The need for an excuse to return led Mr. Clapp into research that turned up the city of Ubar—rich, wicked, and destroyed by Allah for its sins. Legendary—or was it? It took years of study, the collecting of allies, help from NASA, preliminary investigation by helicopter, miscellaneous contributions, and the support of the Sultan of Oman to get the final expedition assembled. Three vehicles bucketed off into the waste of sand that had defeated all previous searches, and found Ubar. Although the reader knows from the start that the city was found, and excavated, the story Mr. Clapp tells is an engaging blend of humor, suspense, mundane difficulties, and exotic detail. "Weeks later, a courteous yet understandably skeptical American Express agent allowed that losing-one's-checks-while-paying-a-ransom-for-goats-frightened-to-death was surely the most unusual explanation he had ever heard."

Tales of the Night

by Peter Høeg,
translated by Barbara Haveland.
Farrar, Straus & Giroux,
304 pages, \$23.00.

Mr. Høeg's short stories are full of echoes, full of ideas, and cover so much ground and so many aspects of life that about all a reviewer can safely report of them is that the date 1929 appears often, distinguished scientists and scholars hover on the periphery, and events never

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A Demilitarized Palestinian State Should Israel, should the world, rely on it?

Even those most sanguine about the current peace negotiations are agreed that the Palestinian entity to be founded should be demilitarized. A demilitarized "West Bank" and Gaza Strip, it is believed, would do away with any military threat to the state of Israel.

What are the facts?

Israel threatened by enemies.

Israel is at peace with Egypt and with Jordan. But Israel is confronted by deadly enemies. Other Arab states are still in a declared or undeclared state of war with Israel. Iran, Moslem though not Arab, lurks in the background, its foremost military and political objective being the destruction of the state of Israel.

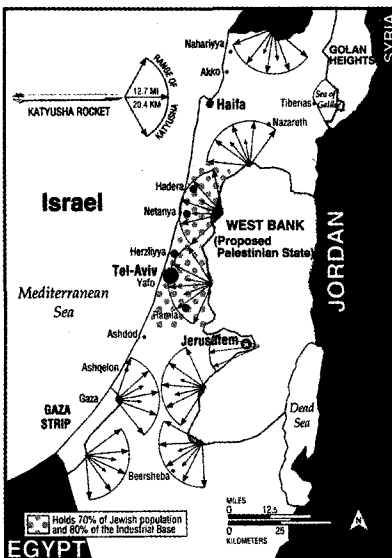
The PLO is a terror organization that

has only one purpose: to kill Jews and to destroy the state of Israel. While the latter objective is beyond its reach, it has been most successful in the former. It seems almost incomprehensible that a group as supposedly level-headed as the previous government of Israel would have entered into a "peace agreement" with them. Not surprisingly, events since the famous "handshake" confirm such skepticism. Despite statements to the contrary, the PLO has still not complied with Israel's main requirement, namely that it forswear the clauses in its "covenant" that call for the destruction of

Israel. Arafat and his lieutenants continue to make blood-curdling speeches to the Arab public, in which they re-assert their old goal of destroying Israel in "stages."

The myth of demilitarization. The assumption that "Palestine" would be demilitarized is not tenable. The Arab nations would not allow it. But mobilization of the "demilitarized" Palestine wouldn't really be required. The weapons of preference of Arab terrorists are the Soviet-made

Katyusha rockets, highly effective missiles, truck-mounted and mobile, ideal for hit-and-run raids against Israel. A look at the map makes clear that these rockets, short-range though they may be, would literally dominate the heartland of Israel. Easily moved and hidden along Israel's new eastern borders, which would be increased from 40 miles in length to over 200 miles, they would rain destruction over most of Israel. They would cover in their entirety Israel's narrow waist that holds 70% of the Jewish population of the country, 80% of its industrial base, its only international airport, and its most important military installations.



A Palestinian state—demilitarized?

The Arabs danced on the roofs of their homes when Iraqi Scud missiles fell on Tel Aviv during the Gulf War. Since the signing of the "peace agreement" they have continued in unrestrained terror and murder against the Jews. Only incurable optimists can believe that an "autonomous" Palestine would wish to become a peaceful neighbor of Israel. If Israel ceded the Gaza Strip—the invasion route since before biblical times—and Judea/Samaria (the "West Bank") to its sworn enemies it would make the country indefensible. Tanks, warplanes, and missiles would only be needed for the final mopping-up process. In the meantime, mortars and Katyushas located on the Judean ridges—Israel's proposed new borders—would suffice to neutralize life and industrial and military activity in Israel. But one can expect that the new leaders of Israel clearly understand this danger and that they will not make concessions that will endanger the security of their country.

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proceed as the reader expects. In short, they are splendid stories and not to be missed by anyone who enjoys elegant writing and intellectual vigor.

Snow

by Betsy Howie.

Harcourt Brace, 160 pages,
\$21.00.

Ms. Howie has the true storyteller's ability to command a reader's attention with the first paragraph. Her narrator is a woman of thirty whose affairs—mental, physical, marital, and financial—can all be filed under M for Mess. In desperation she packs up her two cats and heads north looking for snow. Snow becomes fantasy. One of the cats talks. A stupid and surly bear appears, along with images from the woman's past. At that point the author loses control of her psychotherapeutic parable; redundancy sets in, and with it boredom. This is a first novel, however, and the writer is worth watching.

The "Divine" Guido

by Richard E. Spear.

Yale, 430 pages, \$60.00.

The author is a professor of art history with an unusual approach to his subject, Guido Reni (1575–1642). He discusses the interlocking effects of "Religion, Sex, Money and Art" in the work of a painter who was violently pious, an addicted gambler always greedy for money, a believer in witchcraft, a homosexual by inclination (not necessarily by practice), and a man very testy about his social status. Not an attractive figure. The author attempts to sort out how much of Reni's conduct is attributable to ideas common at the time and how much can be considered the painter's personal invention. The discussion is most interesting when the author concentrates on his own reading of Reni's work (excellently illustrated) and his interpretation of Reni's actions, less so when he depends on outside authorities—for it seems that Professor Spear has never met a quotation he didn't like.

—Phoebe-Lou Adams

Recent books by *Atlantic* authors:

Under the Red Flag by Ha Jin. *University of Georgia*, 207 pages, \$22.95. One of the stories in this collection, "Resurrection," first appeared in *The Atlantic*.

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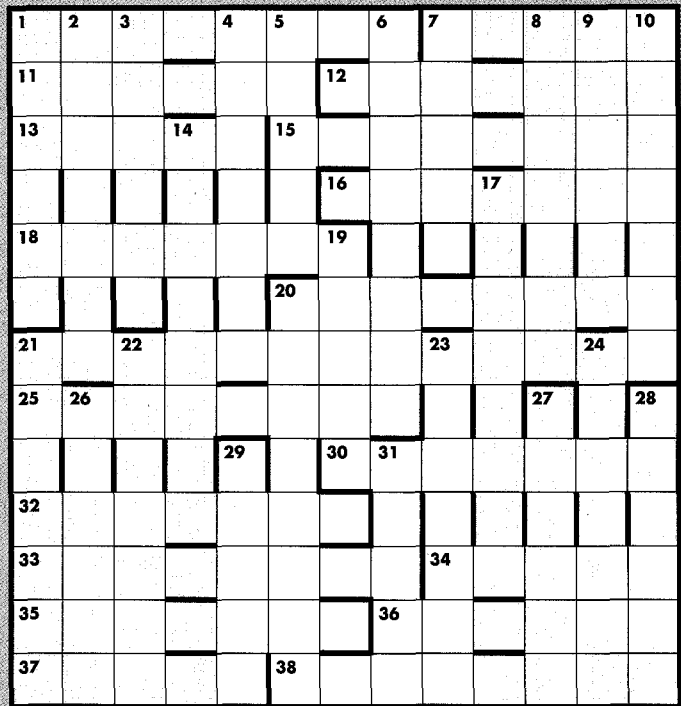
THE PUZZLER

by Emily Cox and Henry Rathvon

Marching Orders

Answers to Down clues proceed normally within their columns in the diagram, but answers to Across clues march to a different drummer: in their shaded areas they obey the command spelled out by the unclued phrase at 21 Across. Seven clue answers are capitalized.

The solution to last month's Puzzler appears on page 113.



Across

1. Committee's leader out of formation in a march (8)
7. Instrument about right for members of a marching band (5)
11. Island in the Malay Archipelago stood out (6)
12. In real-estate document, "rent" is crossed out (7)
13. Heckles British actor in speech (5)
15. Hanging a troublemaker in experiment (8)
16. Activates top agency collecting taxes (7)
18. Notice Doctor Hook providing speech (7)
20. Learned volume by England's leader (8)
25. A hot line reviewed in an operetta (8)
30. Second-rate, as in Mexican food and hot sauce (7)
32. Man's relatives turned mean in crimes (7)

33. Chuck embraces Indonesian island cult member (8)
34. Poet mostly worked backwards (5)
35. Works in Stone Station before Tuesday (7)
36. Fenced ranchland initially was in bad shape (6)
37. Poetry in lovers' eyes (5)
38. Bravest Indians caught by small child (8)

Down

1. Audited one after another apprentice (6)
2. Song finale about leaver of a labyrinthine clue (7)
3. Said mobs reserved supplies (6)
4. In back, the lady cut a second time (7)
5. Bits of dust in ditches filled with water from the sound (5)
6. Heartless note by writer with the cure for the blues (8)
7. Grace Pound is hugged by Mrs. Truman (5)
8. Saw-toothed rodent with withered exterior (7)
9. Warlike king landed upside-down after a tumble on the head? (6)
10. Something very sticky gets inside support for boot again (7)
14. Dazzlers of gold acquired by live bands (8)
17. Pay for extension in call (5,3)
19. Spot location in the ear (5)
20. Recitations of stories about one sun (8)
21. Los Angeles flight in return loops? (7)
22. Leave enemy, having turned tail (7)
23. Bill Field, on "upper-class" scene (7)
24. Shortstop and I getting into line that can be split (7)
26. Latin rumba dislocated a vertebra (6)
27. Cleveland's center chose wrong rebounds (6)
28. Using fuel, illuminated General Assembly opening (6)
29. Treasure you finally buried in lowland (5)
31. Capless, the top Cuban baseball player (5)

Note: The instructions above are for this month's puzzle only. It is assumed that you know how to decipher clues. For a complete introduction to clue-solving, send an addressed, stamped long envelope to The Atlantic Puzzler, 77 North Washington Street, Boston, Mass. 02114.

WORD COURT

by Barbara Wallraff

Have you noticed that announcers on the radio often screen the word that out of their reports? Initial ambiguities force the listener to decide upon the meaning, rather than perceive it clearly as the sentences proceed. Two of a number of examples I have collected: The Saudi group "demanded U.S. troops be removed" (the group wants U.S. troops—oh, no, it doesn't). "He doubts many members would like it" (first he doubts the members, then their preference).

Richard Wendell Fogg
Baltimore, Md.

I've noticed an increased use of the word that, encountering it so often, in fact, that it has begun to irritate me. Would not the sentence "Mr. Smith advised me that he would be departing next weekend and that he would return the following weekend" be better stated in this manner: "Mr. Smith advised me he would depart next weekend and return the following weekend"? Is there a rule of grammar or syntax covering this point?

Louis Candell
Manlius, N.Y.

I have received other letters, too, about that in its role as a conjunction, in which it typically connects a subordinate clause to a main one. Mr. Candell, you'll want to know that by a margin of four to one my correspondents wish they saw or heard more of these *thats*, not fewer.

The magic of *that* is that at the same time it connects, it puts a bit of distance between two elements of a sentence, a neat trick that often comes in handy. As Mr. Fogg's examples illustrate, sometimes one wants to make clear that the object of

the verb is the whole clause and not the noun at the start of the clause, and *that* does this job with a minimum of fuss. Or

one may want to put the distance between two (or more) subordinate clauses that express very different ideas. In the "Mr. Smith" sentences of Mr. Candell's, one *that* (after "Mr. Smith advised me") is surely enough, and I don't mind the version in which there are none at all. But I

would add two to "Mr. Smith advised me he would depart next weekend and the roses need pruning," to make manifest that Mr. Smith advised me of two things, and disparate things at, well, that.

Where to prune *that* is either where ideas are closely related, as they are in the first "Mr. Smith" example, or where multiple *thats* begin to sound like a drumbeat: "He said *that* he had advised me *that* the departure *that* he planned . . ."



Shame on you. When I turned to Word Court in the November Atlantic, I was shocked to read the sentence "This isn't some-

thing that we can blame President Clinton for" in your response to one of the questions. Unless you like to leave participles dangling, the sentence would have been more properly worded "This isn't something for which we can blame President Clinton."

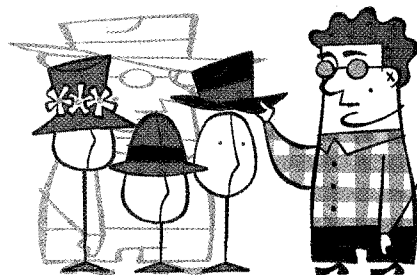
Please be more careful of your own writing and the editing of your column. You do set an example for proper English usage in this grammatically challenged society of which we are all a part.

Scott Rupp
St. Paul, Minn.

Now, hold on. "Shame on you" is considered polite discourse where you come from?

Oops. I mean, Now, on hold. "Shame on you" is considered polite discourse from where you come?

What's more (sorry, but you started this), that's no dangling participle; aren't you, rather, objecting to my having ended the sentence with a preposition? If so, kindly have a look at Fowler's *Modern English Usage* (any of the three editions), or Theodore Bernstein's *The Careful Writer*, or *The American Heritage Dictionary*, or pretty much any reputable usage guide, under "preposition at end" or "preposition," and see if this doesn't change your point of view. Good writers throughout the history of English—from Chaucer and Shakespeare to Alison Lurie and David Lodge—have not shrunk from ending clauses or sentences with prepositions. It isn't something that we should go out of our way to do, but if the alternatives that come readily to mind seem stilted, there's no reason to go out of our way to avoid doing it, either.



What is the proper term for someone who makes hats? My female friend insists on milliner; I prefer haberdasher. Is there a gender-neutral term for someone who designs hats for males and females alike?

Daniel Arbelaez
Cambridge, Mass.

How about hatter?

Have you recently had a language dispute that you would like this column to resolve? Write to Word Court in care of *The Atlantic Monthly*, 77 North Washington Street, Boston, MA 02114, or send E-mail to MsGrammar@TheAtlantic.com. All letters become the property of Word Court.

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